NATURAL HISTORY,

GENERAL AND PARTICULAR,

BY THE

COUNT DE BUFFON.

VOL. VIII.

HISTORY OF QUADRUPEDS.

Sorajee Rajah 1821

NATURAL HISTORY,

GENERAL AND PARTICULAR,

BY THE

COUNT DE BUFFON,

ILLUSTRATED WITH ABOVE SIX HUNDRED COPPER PLATES.

THE

HISTORY OF MAN AND QUADRUPEDS

TRANSLATED, WITH NOTES AND OBSERVATIONS,

BY WILLIAM SMELLIE,

MEMBER OF THE ANTIQUARIAN AND ROYAL SOCIETIES OF EDINBURGH.

A NEW EDITION,

CAREFULLY CORRECTED AND CONSIDERABLY ENLARGED, BY MANY ADDITIONAL ARTICLES, NOTES, AND PLATES,

AND

SOME ACCOUNT OF THE LIFE OF M. DE BUFFON.

BY WILLIAM WOOD, F.L.S.

IN TWENTY VOLUMES.

VOL. VIII.

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CONTENTS.

	PAGE.
Natural History of the Elk and the Rein-Deer	1
the Wild Goat, the Chamois Goat, and other Goats .	64
the Saiga, or Scythian Antelope	99
the Antelopes, or Gazelles .	107
the Pasan	156
the Antelope	165
the Tzeiran	170
the Blue Goat	177
the Antelope, or Leaping Goat of the Cape of Good Hope	178
the Klippspringer	184
the Nanguer and Nagor .	186
the Ritbock	190
the Kevel	193
the Bosbok	194
the Bubalus	197
the Koba and the Kob . .	207
the Gnou	209
the Nilgaut	215
the Coudous, or Indian Antelope	232
the Canna	236
the Condoma, or Striped Antelope	245
the Guib, or Harnessed Antelope	258
the Grimm, or Guinea Antelope	261
the Mazames	271
the Chevrotains, or Small Antelopes	281

PAGE.
Natural History of the Chevrotain of Ceylon . 289
the Chevrotain, or Little Antelope of Java . . . 291
the Musk 293
the Cabiai, or Thick-nosed Tapir 307
the Porcupine 312
the Malacca Porcupine . . 321
the Coendou, or Brasilian Porcupine 323
the Long-tailed Coendou . 330
the Canada Porcupine . . 332
the Tanrec and the Tendrac, or Asiatic Hedgehog . . 336
the Giraffe, or Camelopard . 341
the Lama and the Pacos . 372

ERRATA.

Page 66, note, *for* "præcique" *read* præcipue.
184, line 4, "omitted" mentioned.

DIRECTIONS TO THE BINDER.

		To face Page
CCXLV.	Elk	1
CCXLVI.	Ditto Male	37
CCXLVII.	Female Rein-Deer	43
CCXLVIII.	Wild Goat	98
CCXLIX.	Chamois Goat	*ibid.*
CCL.	African He Goat	*ibid.*
CCLI.	Dwarf Goat	*ibid.*
CCLII.	Buck of Juda	*ibid.*
CCLIII.	She Goat of Juda	*ibid.*
CCLIV.	Buck of Juda	*ibid.*
CCLV.	Gazelle	108
CCLVI.	Kevel	110
CCLVII.	Corine	112
CCLVIII.	Pasan	156
CCLIX.	Antelope	165
CCLX.	Ditto Female	*ibid.*
CCLXI.	Tzeiran	170
CCLXII.	Leaping Goat	178
CCLXIII.	Klippspringer	184
CCLXIV.	Nanguer	186
CCLXV.	Nagor	188
CCLXVI.	Ritbok	190
CCLXVII.	Ditto Female	*ibid.*
CCLXVIII.	Bosbok	194
CCLXIX.	Bubalus	197
CCLXX.	Gnou	209
CCLXXI.	Nilgaut	215
CCLXXII.	Ditto Female	*ibid.*
CCLXXIII.	Canna	236
CCLXXIV.	Condoma	245
CCLXXV.	Guib	258
CCLXXVI.	Grimm	261
CCLXXVII.	Cariacou	274
CCLXXVIII.	Memina	281
CCLXXIX.	Chevrotain of Java	291
CCLXXX.	Musk	293
CCLXXXI.	Cabiai	307

			To face Page
Plate	CCLXXXII.	Porcupine	312
	CCLXXXIII.	Ditto	*ibid.*
	CCLXXXIV.	Malacca Porcupine	321
	CCLXXXV.	Coendou	323
	CCLXXXVI.	Urson	332
	CCLXXXVII.	Tanrec	336
	CCLXXXVIII.	Tendrac	*ibid.*
	CCLXXXIX.	Little Tendrac	338
	CCXC.	Giraffe	341
	CCXCI.	Skeleton of the Giraffe	366
	CCXCII.	Lama	372
	CCXCIII.	Vicuna	391

Plate 245

A. Bell Sculp.t

ELK.

NATURAL HISTORY.

THE ELK* AND THE REIN-DEER†.

THOUGH the elk and rein-deer are animals of different species, yet, as it would be difficult to give the history of the one without encroach-

* CHARACTER SPECIFICUS ‡.

CERVUS ALCES. C. cornibus acaulibus palmatis, caruncula gutturali. — *Linn. Syst. Nat. Gmel.* i. p. 175. — *Schreb. Saeugth.* v. pl. 246, A. B. — *Erxleb. Mamm.* p. 298.

Cervus (Alces) cornibus ab imo ad summum palmatis. — *Briss. Regn. Anim.* p. 93.

ACHLIS. — *Plin. Hist. Nat.* viii. c. 15.

ALCE. — *Aldrov.* p. 866, fig. p. [illegible], 870. — *Gesn. Quadr.* p. 1, 2. — *Jonst. Quadr.* pl. 30, 31. — *Ray's Quadr.* p. 86.

L'ELAN. — *Buff. Hist. Nat. par Sonn.* xxx. p. 92, pl. 4, 5.

MOOSE DEER. — *Dudley, Phil. Trans.* No. 368, p. 165. — *Dale, Ibid.* No. 444, p. 384. — *Josselyn, Voy. New Eng.* p. 88.

ORIGNAL. — *Charlev. Nouv. Franc.* iii. p. 126.

ELK. — *Penn. Hist. Quadr.* i. p. 105, pl. 17. — *Mus. Lev.*

‡ For the generic character, see Stag.

ing on that of the other, we find it convenient to treat of them under one article. Most ancient, as well as modern authors, have con-

i. p. 33, pl. 8.—*Bew. Quadr.* p. 103, 112.—*Shaw's Gen. Zool.* ii. p. 261, pl. 174, 175.

HABITAT

in borealibus Europæ, Asiæ, Americæ.

W.

The elk has horns with short beams spreading into large and broad palms, one side of which is plain, the outmost furnished with several sharp snags. It has no brow antlers. The largest horn I have seen is in the house belonging to the Hudson's Bay Company, and weighed fifty-six pounds. The length is thirty-three inches, between tip and tip thirty-four, and the breadth of the palm thirteen and a half. There is in the same place an excellent picture of an elk which was killed in the presence of Charles XI. of Sweden, and weighed 1,229 pounds. It is a very deformed and seemingly disproportioned beast. A young female, of about a year old, was to the top of the withers five feet, or fifteen hands. The head alone was two feet, and the length of the whole animal, from nose to tail, was about seven feet. The neck was much shorter than the head, with a short, thick, upright mane, of a light brown colour. The eyes were small, the ears one foot long, very broad and s[illegible]uching, and the nostrils very large. The upper lip was squ[illegible], hung greatly over the lower, and had a deep sulcus in th[illegible] middle, so as to appear almost bifid. The nose was very broad. Under the throat was a small excrescence, from whence hung a long tuft of coarse black hair. The withers were very high, and the fore-feet three feet three inches long. From the bottom of the hoof to the end of the tibia was two feet four inches. The hind-legs were much shorter than the fore-legs. The hoofs were much cloven; and the tail is very short, dusky above, and white beneath. The general colour of the body was a hoary black, but more gray above the face than any where else. This animal was

founded them, or exhibited them under equivocal denominations, which are equally applicable to both. The Greeks knew neither the elk nor

living last spring at the marquis of Rockingham's house, at Parson's Green.—*Penn. Synops. Quadr.* p. 40.

In the Celtic language, *Elch*; in modern Latin, *Alce*; in Greek, *Αλκη*; in German, *Hellend*, or *Ellend*; in Polish, *Loss*; in Swedish *Oelg*; in Russ, *Lozzi*; in Norwegian, *Ælg*; in Chinese *Han-ta-han*; in Canada, *Orignal*; in French, *Elan*.

† CHARACTER SPECIFICUS.

Cervus Tarandus.—C. cornibus ramosis recurvatis teretibus; summitatibus palmatis.—*Linn. Syst. Nat. Gmel.* i. p. 177.—*Schreb.* v. pl. 248, A. B. C. C.—*Erxleb. Mamm.* p. 305.

Tarandus.—*Plin. Hist. Nat.* viii. c. 34.—*Aldr. Bisulc.* p. 859, fig. p. 861.—*Jonst. Quadr.* p. 90, pl. 37.

Rangifer.—*Gesn. Quadr.* p. 950, ic *Quadr.* p. 62.

Cervus Rangifer.—*Ray's Quadr.* p. 88.

Le Renne.—*Buff. Hist. Nat. par Sonn.* xxx. p. 92, pl. 5, 8.

Rein-Deer.—*Penn. Hist. Quadr.* i. p. 111, pl. 18.—*Bew. Quadr.* p. 114.—*Shaw's Gen. Zool.* ii. p. 269, pl. 176. —*Wood's Zoography*, i. p. 54, pl. 2.

HABITAT

in borealibus Europæ, Asiæ usque in Kamtschatkam Americæ. In Laponia per æstatem alpes incolit, per hiemem deserta plana.

Brisson has specified three varieties of rein-deer; the Rangifer, Grœnlandicus, and Caribou.

W.

The rein-deer has large but slender horns, bending forward, the top palmated, brow antlers broad and palmated. Both sexes have horns; those of the female are less, and with fewer branches. A pair from Greenland were three feet nine

the rein-deer; for Aristotle* makes no mention of them: and, among the Latins, Julius Cæsar is the first who employed the word *alce*. Pausanius†, who wrote about a century after Cæsar, is the first Greek author in which the

inches long, two feet and a half from tip to tip, and weighed nine pounds twelve ounces. The height of a full grown rein-deer is four feet six inches. The space round the eye is always black. When it first sheds its coat, the hairs are of a brownish ash colour, and afterwards change to white. The hairs are very close set together, and, along the fore part of the neck, they are very long and pendent. The hoofs are large, and the tail short.—*Penn. Synops. Quadr.* p. 46.

The rein-deer was unknown to the Greeks. In French, *Rangier, Ranglier, le Renne*; in Latin, *Tarandus*; in Norwegian, *Rehen*; in Lapland, *Boetsoi*; in German, *Reenthier*; in Swedish, *Rhen*; in Canada, *Caribou*; in modern Latin, *Rangifer*. . . . . In partibus magnæ Lapponiæ bestia est de genere cervorum. . . . . Rangifer duplici ratione dicta; una quod in capite ferat alta cornua velut quos quercinarum arborum ramos: alia quod instrumenta cornibus pectorique, quibus hiemalia plaustra trahit imposita *Rancha* et *Locha*, patrio sermone vocantur.—*Olia Magni. Hist. de Gent. Sept.* p. 135.

* We have shown, under the article *Axis*, that the hippelaphus of Aristotle is not the elk.

† Argumento sunt Æthiopici tauri et *alces* feræ Celticæ, ex quibus mares cornua in superciliis habent, fœmina caret. *Pausan. in Eliacis.* . . . . *Alce* nominata fera specie inter cervum et camelum est; nascitur apud Celtas; explorari investigarique ab hominibus animalium sola non potest, sed obiter aliquando dum alias venantur feras, hæc etiam incidit. Sagacissimam esse aiunt, et hominis odore per longinquum intervallum percepto, in foveas et profundissimos specus sese abdere. Venatores montem vel campum ad mille stadia circundant, et contracto subinde ambitu, nisi intra illum fera delitescat, non alia ratione eam capere possunt.—*Idem. In Bœoticis.*

name Αλκη occurs; and Pliny *, who was nearly contemporary with Pausanius, has given some obscure intimations of the elk and rein-deer under the appellations of *alce*, *machlis*, and *tarandus*. The name *alce*, therefore, cannot be properly considered as either Greek or Latin; but it ap-

* Septentrio fert et equorum greges ferorum, sicut asinorum Asia et Africa: præter ea alcem, ni proceritas aurium et cervicis distinguat, jumenta similem: item notam in Scandinavia insula, nec unquam visam in hoc orbe, multis tamen narratam, *machlin*, haud dissimilem illi, sed nullo suffraginum flexu; ideoque non cubantem, sed acclivem arbori in somno, eaque incisa ad insidias, capi; velocitatis memoratæ. Labrum ei superius prægrande: ob id retrograditur in pascendo, ne in priora tendens, involvatur.—*Plin. Hist. Nat.* lib. viii. cap. 15. Mutat colores et Schytarum tarandus. . . . . Tarando magnitudo quæ bovi, caput majus cervino, nec absimile; cornua ramosa; ungulæ bifidæ: villus magnitudine ursorum, sed cum libuit sui coloris esse, asini similis est: tergoris tanta duritia ut thoraces ex eo faciant. . . . . Metuens latet, ideoque raro capitur.—*Idem.* cap. 34. I have quoted these two passages of Pliny, in which, under the denomination of *alce, machlis,* and *tarandus,* he seems to point out three different animals. But I shall afterwards show, that both *machlis* and *alce* apply solely to the elk; and that, though most naturalists believe the *tarandus* of Pliny to be the elk, it is much more probable that he means the rein-deer by this appellation. I acknowledge, however, that the indications of Pliny are so confused, and even false, that it is difficult to determine this point with precision. The commentators upon Pliny, though they had much erudition, were but little versed in natural history; and this is one reason why we find so many obscure and ill interpreted passages in his writings. The same work is applicable to the commentators and translators of Aristotle. We shall, therefore, endeavour to restore some words which have been changed, and to correct some passages of those two authors that have been corrupted.

pears to have been derived from the Celtic language, in which the elk is called *elch* or *elk*. The Latin name of the rein-deer is still more uncertain. Several naturalists have thought that it was the *machlis* of Pliny; because that author, when speaking of the northern animals, mentions, at the same time, the *alce* and the *machlis*; the last of which, he remarks, is peculiar to Scandinavia, and was never seen either at Rome, or any part of the Roman empire. In Cæsar's Commentaries *, however, we find a passage,

* Est bos in Hercinia silva, cervi figura, cujus a media fronte inter aures unum cornu existit excelsius, magisque directum his quæ nobis nota sunt cornibus: ab ejus summo sicut palmæ ramique late diffunduntur. Eadem est fœminæ marisque natura; eadem forma, magnitudoque cornuum.—*Jul. Cæsar de Bello Gallico*, lib. vi. *Note*, This passage is decisive. The rein-deer, in fact, has brow antlers which seem to form an intermediate horn. His horns are divided into several branches, terminated by large palms; and the female has horns as well as the male. But the females of the elk, the stag, the fallow deer, and the roe-deer, have no horns. Hence it is apparent, that the animal here pointed out by Cæsar, is the rein-deer, and not the elk; especially as, in another place, he mentions the elk, under the name of *alce*, in the following terms: Sunt item in Hercinia silva quæ appellantur *alces*: harum est consimilis capris (*capreis*) figura et varietas pellium: sed magnitudine paulo antecedunt mutilæ quæ sunt cornibus et crura sine nodis, articulisque habent, neque quietis causa procumbunt. . . . . His sunt arbores pro cubilibus; ad eas se applicant: atque ita paulum modo reclinatæ quietem capiunt: quarum ex vestigiis cum est animadversum a venatoribus quo se recipere consueverint, omnes eo loco aut a radicibus subruunt aut abscindunt arbores tantum ut summa species earum stantium relinquatur: huc cum se consuetudine reclinaverint, infirmas arbores pondere affligunt atque una ipsæ concidunt.

which can apply to no other animal than the rein-deer, and seems to prove that it then existed in the forests of Germany: and Gaston Phæbus, fifteen centuries after Julius Cæsar, seems to speak of the rein-deer, under the name of *rangier*, as an animal, which, in his time, existed in the forests of France. He has even given a good description* of this animal, and of the manner

— *de Bello Gallico*, lib. vi. I allow that this second passage contains nothing precise but the name *alce*; and, to make it apply to the elk, the word *capreis* must be substituted for *capris*; and we must suppose, at the same time, that Cæsar had only seen female elks, which have no horns. All the rest is intelligible; for the elk has very stiff limbs; that is, their articulations are very firm and close; and, as the ancients believed that there were animals such as the elephant, which could neither bend their limbs nor lie down, it is not surprising that they attribute to the elk this fabulous story of the elephant.

* The *rangier* or *ranglier* is an animal that resembles the stag; but his horns are larger and much more branched. When hunted, he flies, on account of the great weight on his head. But, after running long, and doubling, he places his buttocks against a tree, to prevent any attack from behind, and bends his head toward the ground. In this situation, the dogs dare not approach him, because his whole body is defended by his horns. If they come behind him, he strikes them with his heels. The greyhounds and bull-dogs are terrified when they see his horns. The rangier is not taller than the fallow deer; but he is much thicker. When he rears his horns backward, they cover his whole body. He feeds like the stag or fallow deer, and throws his dung in clusters. He lives very long. The hunters shoot him with arrows, or take him with different kinds of snares. He is fatter than a stag. Like the fallow-deer, he follows the stag in the rutting season.

As to the manner of hunting the *rangier* or *ranglier*; when

of hunting it. As his description cannot apply to the elk, and as he gives, at the same time, the mode of hunting the stag, the fallow deer, the roebuck, the wild goat, the chamois goat, &c., it cannot be alleged, that, under the article *rangier*, he meant any of these animals, or that he had been deceived in the application of the name. It is apparent, therefore, from these positive evidences, that the rein-deer formerly existed in France, especially in the mountainous parts, such as the Pyrennees, in the neighbourhood of which Gaston Phæbus resided, as lord of the county of Foix; and that, since this period, they have been destroyed, like the stags which were formerly common in this country, and which now exist not in Bigore, Couserans, nor in the adjacent provinces. It is certain that the rein-deer is found only in more northern latitudes. But we likewise know, that the climate of France was formerly much moister and colder, on account of the many forests and marshes which have since been cut down and drained. From the emperor Julian's letter, we learn what was the rigour of the frost at Paris in his time. The

the hunters go in quest of this animal, they should separate the dogs, to prevent his running into the thickest parts of the forest, which are inhabited by the fallow deer and roebucks. He should separate his nets and snares according to the situation of the forest, and lead his hounds through the wood. As the horns of the rangier are high and heavy, few hunters attempt to seize him with hounds.—*La Venerie de Jacquet Dufouilloux*, p. 97.

description he gives of the ice on the Seine is perfectly the same with what the Canadians tell us of the ice on the rivers of Quebec. Gaul, under the same latitude with Canada, was, two thousand years ago, exactly what Canada is at present, namely, a climate sufficiently cold to nourish animals which are now found only in the more northern regions.

From all these facts, therefore, it is evident, that the elk and the rein-deer formerly existed in the forests of Gaul and Germany; and that the passages in the Commentaries of Cæsar can apply to no other animals. In proportion as the lands were cleared, and the waters dried up, the temperature of the climate would become more mild, these animals, who delight in cold, would first abandon the flat countries, and retire to the snowy mountains, where they still subsisted in the days of Gaston de Foix. The reason why they are no longer found there is obvious: the heat of the climate has been gradually augmented by the almost total destruction of the forests, by the successive lowering of the mountains, by the diminution of the waters, by the multiplication of the human race, and by culture and improvement of every kind. It appears, likewise, that Pliny has borrowed from Cæsar almost every thing he has said of these two animals, and that he was the first who introduced confusion into their names. The *alce* and the *machlis* he mentions at the same time; from which we are led to conclude that these

two names denote two different animals *. But, if we consider, 1. That he mentions the *alce* only once, without giving any description of it; 2. That he only employs the word *machlis*, which is neither Greek nor Latin, but seems to have been coined †, and, according to his commentators, is changed into *alce* in several ancient manuscripts; 3. That he attributes to the *machlis* all that Julius Cæsar has said of the *alce*; the passage of Pliny must unquestionably have been corrupted, and these two names must denote the same animal, namely, the *elk*. The decision of this question will resolve another. As the *machlis* is the *elk*, the *tarandus* must be the *rein-deer*. The name *tarandus* is found in no other author before Pliny, and has given rise to various interpretations. Agricola and Elliot, however, have not hesitated to apply it to the rein-deer; and, for the reason above as-

* Several of our most learned naturalists, and particularly Mr. Ray, have thought that the *machlis*, being placed so near the *alce*, could be no other than the rein-deer. *Cervus rangifer, the rein-deer; Plinio machlis; Raii Synops. Quad.* p. 88. Because I am by no means of the same opinion, I have here given a detail of my reasons.

† On the margin of this passage of Pliny, we have *achlin*, instead of *machlin*: *Fortassis achlin, quod non cubet*, say the commentators. This name, therefore, appears to have been coined on the supposition that the animal cannot lie down. On the other hand, by transposing the *l* in *alce*, they have made *acle*, which differs little from *achlis*. Hence we may still farther conclude, that this word has been corrupted by the transcribers, especially as we find *alcem*, instead of *machlin*, in several ancient manuscripts.

signed, we willingly subscribe to their opinion. Besides, we should not be surprised at the silence of the Greeks, nor at the ambiguity with which the Latins have mentioned these animals; since the northern regions were absolutely unknown to the former, and the latter had all their information concerning these regions from the relations of others.

Now, in Europe and Asia, the elk is found only on this side, and the rein-deer beyond, the polar circle. In America, we meet with them in lower latitudes; because there the cold is greater than in Europe. The rein-deer, being able to endure the most excessive cold, is found in Spitzbergen*; he is also very common in Greenland†, and in the most northern regions of Lapland‡ and

* In every part of Spitzbergen, the rein-deer are found, but particularly in *Rehen-feld*, a place which received its name from the number of rein-deer it produces. They are also very numerous in Foreland, near Muscle-Haven. . . . . We arrived in this country in the spring, and killed some rein-deer, which were very meager; from which circumstance we conclude, that, notwithstanding the unfertility and coldness of Spitzbergen, these animals make a shift to pass the winter there, and to live upon the small quantity of food they can procure. — *Recueil des Voyages au Nord*, tom. ii. p. 113.

† Captain Craycott, in the year 1738, brought a male and a female rein-deer from Greenland to London. — *Edwards's Hist. of Birds*, p. 51; where we have a description and figure of this animal under the name of the *Greenland fallow deer*, which, as well as the *Greenland roebuck*, or *Caprea Grœnlendica*, mentioned by Grew, in his Description of the Museum of the Royal Society, can be nothing else but the rein-deer. Both these authors, in their descriptions, mention, as a peculiar character, the down with which the horns of these animals

of Asia*. The elk approaches not so near the pole, but inhabits Norway†, Sweden‡, Poland§,

were covered. This character, however, is common to the rein-deer, the stag, the fallow-deer, and all the deer kind. This hair or down continues on the horns during the summer season, which is the time when they are growing, and the only time that vessels can sail to Greenland. It is not, therefore, surprising, that, during this season, the horns of the rein-deer should be covered with down. Hence this character is of no importance in the descriptions given by these authors.

Upon the coasts of Frobisher's Straits, there are stags nearly of the colour of asses, and whose horns are higher and much larger than those of our stags. Their feet are from seven to eight inches in circumference, and resemble those of our oxen.—*Lade's Voy.* tom. ii. p. 297. *Note,* This passage seems to have been copied from captain Martin's Voyage, p. 17, where he remarks, "There are great numbers of stags on the lands of Warwick road, the skin of which resembles that of our asses. Their head and horns, both in length and breadth, surpass those of our stags. Their foot is as large as that of an ox, being eight inches broad."

‡ The rein-deer are numerous in the country of the Samoiedes, and over all the north.—*Voyage d'Olearius,* tom. i. p. 126. *L'Hist. de la Lapponie, par Scheffer,* p. 209.

* The Ostiacks of Siberia, as well as the Samoiedes, employ rein-deer and dogs for drawing their carriages.—*Nouv. Mem. de la Grande Russie,* tom. ii. p. 181. Among the Tonguese, there are great numbers of rein-deer, elks, bears, &c.—*Voyage de Gmelin,* tom. ii. p. 206.

† See the chase of the elk in Norway, by the Sieur de la Martiniere, in his Voyage to the North, p. 10.

‡ Alces habitat in silvis Sueciæ, rarius obvius hodie, quam olim.—*Linn. Fauna Suecica,* p. 13.

§ Tenent alces prægrandes Albæ Russiæ sylvæ, fovent Palatinatis varii, Novogrodensis, Brestianensis, Kioviensis, Volhinensis circa *Stepan,* Sandomiriensis circa *Nisko,* Livoniensis in Capitaneatibus quatuor ad Poloniæ regnum pertinentibus, Varmia iis non destituitur.—*Rzaczynski auctuarium,* p. 305.

Lithuania *, Russia †, and Siberia and Tartary ‡, as far as the north of China. In Canada, and in all the northern parts of America, we meet with the elk, under the name of the *orignal*, and the rein-deer under that of *caribou*. Those naturalists who suspect that the orginal § is not the elk, and the cari-

* The *Loss* of the Lithuanians, the *Lozzi* of the Muscovites, the *Oelg* of the Norwegians, the *Elend* of the Germans, and the *Alce* of the Latins, denote the same animal: it is very different from the Norwegian *Rhen*, which is the rein-deer. . . . . No elks are produced in Lapland; but they are brought from other places, and particularly from Lithuania. . . . . . They are found in South Finland, in Carelia, and in Russia.—*Hist. de la Lapponie, par Scheffer*, p. 310.

† In the neighbourhood of Irkutzk, there are elks, stags, &c.—*Voyage de Gmelin*, tom. ii. p. 165. The elks are common in the countries of the Manheous Tartars and of the Solons.—*Id. ib.*

‡ The Tartarian animal called *Han-ta-han* by the Chinese appears to be the same with the elk. "The han-ta-han," say the missionaries, "is an animal which resembles the elk. "The hunting of it is a common exercise in the country of the Solons, and the emperor Kamhi sometimes partakes of this amusement. There are han-ta-hans as large as our oxen. They are only found in particular cantons, especially toward the mountains of Sevelki, in marshy grounds, which they are fond of, and where they are easily hun ed, because their weight retards their flight."—*Hist. Gen. des Voyages*, tom. xvi. p. 602.

§ The *elks* or *orignals* are frequent in the province of Canada, and very rare in the country of the Hurons; because these animals generally retire to the coldest regions. . . . . The Hurons call the elks *sondareinta*, and the caribous *ausquoy*, of which the savages gave us a foot, which was hollow, and so light, that it is not difficult to believe what is said of this animal, that he walks on the snow without making a

bou * the rein-deer, have not compared Nature with the relations of travellers. Though smaller,

track. The elk is taller than a horse. . . . His hair is commonly gray, sometimes yellow, and as long as a man's finger. His head is very long, and he has double horns like the stag. They are as broad as those of the fallow deer, and three feet in length. His foot is cloven like that of the stag, but much larger. His flesh is tender and delicate. He pastures in the meadows, and likewise eats the tender twigs of trees. Next to fish, he is the principal food of the Canadians. — *Voyage de Sagard Theodat.* p. 308. There are elks in Virginia.—*Hist. de la Virginie,* p. 213. We find in New England great numbers of *orignals* or *elks.* — *Descript. de l'Amerique Septent. par Denys,* tom. i. p. 27. The island Cape Britain was famed for the chase of the orignal, where they were very numerous; but they have since been extirpated by the savages.—*Ibid.* tom. i. p. 163. The orignal of New France is as strong as a mule; his head is nearly of the same shape. His neck is longer, and his whole body more meager. His limbs are long and nervous. His foot is cloven, and his tail is very short. Some of them are gray, others reddish or black, and, when old, their hair is hollow, as long as a man's finger, and makes excellent mattresses, or ornaments for saddles. The elk has large, flat, palmated horns. Some of them are a fathom long, and weigh from a hundred to a hundred and fifty pounds. They shed like those of the stag. — *Ibid.* tom. ii. p. 321. The orignal is a species of elk, very little different from those we see in Muscovy. He is as large as a mule, and of a similar figure, except in the muzzle, the tail, and the large flat horns, which, if we may credit the savages, sometimes weigh three hundred, and even four hundred pounds. This animal commonly frequents open countries. His hair is long, and of a brown colour. His skin, though not thick, is very strong and hard. His flesh is good, but that of the female is most delicate. — *Voyage de la Hontan,* tom. i. p. 86.

* The caribou is an animal with a large muzzle and long ears. As his foot is broad, he runs with ease over the hardened snow, which distinguishes him from the orignal, whose

like all the other American quadrupeds, than those of the Old Continent, they are unquestionably the same animals.

We will acquire juster ideas of the elk and rein-deer by comparing both with the stag: the elk is taller, thicker, and stands higher on his legs; his neck is also shorter, his hair longer, and his horns much longer than those of the stag. The rein-deer is not so tall; his limbs * are shorter and thicker, and his feet much larger. His

feet always sink. — *Voyage de la Hontan*, tom. i. p. 90. The island of St. John is situated in the great bay of Saint Lawrence. There are no orignals in this island; but there are caribous, which seem to be another species of orignal. Their horns are not so strong; their hair is thinner and longer, and almost entirely white. Their flesh is whiter than that of the orignal, and makes excellent eating. — *Descript. de l'Amerique Septent. par Denys*, tom. i. p. 202. The caribou is a kind of stag, which is very nimble and strong. — *Voyage de Dierville*, p. 125. The caribou is not so tall as the orignal, and its figure partakes more of the ass than of the mule, and equals the stag in fleetness. Some years ago, one of them was seen on Cape Diamond, above Quebec. . . . The tongue of this animal is much esteemed. His native country seems to be in the neighbourhood of Hudson's Bay. — *Hist. de la Nouv. France, par le P. Charlevoix*, tom. iii. p. 129. The finest hunting in North America is that of the caribou. It continues the whole year; and, particularly in spring and autumn, we see them in troops of above three or four hundred at a time. . . . The horns of the caribou resemble those of the fallow deer. When first seen by our sailors, they were afraid, and ran from them. — *Lettres Edifiantes, recueil* x. p. 322.

* The stag stands higher on his legs, but his body is smaller than that of the rein-deer. — *Hist. de la Lapponie, par Scheffer*, p. 205.

hair is very bushy, and his horns are longer, and divided into a great number of branches *, each of which is terminated by a palm: but those of the elk have the appearance of being cut off abruptly, and are furnished with broaches. Both have long hair under the neck, short tails, and ears much longer than those of the stag. Their motion consists not of bounds or leaps, like the stag and roebuck: it is a kind of trot, but so quick and nimble, that they will pass over nearly the same ground in an equal time, without being fatigued; for they will continue to trot in this manner during a whole day, or even two

* Many rein-deer have two horns, which bend backward, as those of the stags generally do. From the middle of each a small branch issues, which divides, like those of the stag, into several antlers that stretch forward, and, by their figure and situation, might pass for a third horn, though it frequently happens that the large horns push out similar branches from their own trunks: thus another small branch advances toward the front, and then the animals seem to have four horns, two behind like the stag, and two before, which last is peculiar to the rein-deer. The horns of the rein-deer are also sometimes disposed in the following manner; two bend backward, two smaller ones mount upward, and two still smaller bend forward, being all furnished with antlers, and having but one root. Those which advance toward the front, as well as those which mount upward, are, properly speaking, only branches or shoots of the large horns which bend backward like those of the stag. This appearance, however, is not very common; we more frequently see rein-deer with three horns, and the number of those with four, as formerly described, is still greater. All this applies only to the males; for the horns of the females are smaller, and have not so many branches. — *Scheffer*, p. 306.

days*. The rein-deer keeps always on the mountains†; and the elk inhabits low grounds and moist forests. Both go in flocks like the stag; and both may be tamed; but the rein-deer is more easily tamed than the elk. The latter, like the stag, has never lost its liberty. But the rein-deer has been rendered domestic by the most stupid of the human race. The Laplanders have no other cattle. In this frozen climate, which receives only the most oblique rays of the sun, where the night and the day constitute two seasons, where the earth is covered with snow from the beginning of autumn to the end of spring, where the bramble, the juniper, and the moss, constitute the only verdure of the summer, man can never hope to nourish cattle. The horse, the ox, the sheep, and all our other useful animals, could never find subsistence there, nor be able to resist the rigours of the frost. It would have been necessary to select from the deepest forests those species of animals which are least wild and most profitable. The Laplanders have actually done what we would be obliged to do, if all our cattle were destroyed. To supply their place, it would then

* The orignal neither runs nor bounds; but his trot equals the course of the stag. We are assured by the Savages, that he may be trotted three days and three nights without resting.—*Voyage de la Hontan*, tom. i. p. 85.

† Rangifer habitat in Alpibus Europæ et Asiæ, maxime septentrionalibus; victitat lichene rangifero. . . . . Alces habitat in borealibus Europæ Asiaque populetis.—*Linn. Syst. Nat.* p. 67.

be necessary to tame the stags and roebucks of our woods, and to render them domestic. This end, I am persuaded, might be easily accomplished; and we should soon derive as much benefit from these animals, as the Laplanders do from their rein-deer. This example should lead us to admire the unbounded liberality of Nature. We use not one half of the treasures she presents to us; for her resources are inexhaustible. She has given us the horse, the ox, the sheep, and other domestic animals, to serve, to nourish, and to clothe us; and she has other species still in reserve, which might supply the want of the former: these we have only to subdue, and to render them subservient to our purposes. Man is equally ignorant of the powers of Nature, and of his own capacity to modify and improve her productions. Instead of making new researches, he is continually abusing the little knowledge he has acquired.

By estimating the advantages the Laplanders derive from the rein-deer, we shall find that this animal is worth two or three of our domestic animals. They use him as a horse in drawing sledges and carriages. He is so nimble and expeditious, that in one day he performs with ease a journey of thirty leagues, and runs with equal sureness on the frozen snows as upon the finest downs. The milk of the female affords a more substantial nourishment than that of the cow. The flesh of this animal is exceedingly good. His hair makes excellent furs; and his skin is convertible into a very strong and pliant leather.

Thus the rein-deer alone furnishes every article we derive from the horse, the ox, and the sheep.

The manner in which the Laplanders rear and manage the rein-deer, merits particular attention. Olaus *, Scheffer †, and Regnard ‡, have given interesting details on this subject, of which the following is an abridgment. These authors tell us, that the horns of the rein-deer are much larger, and divided into a greater number of branches than those of the stag. During winter, the food of this animal is a white moss, which he knows how to find under the deepest snow, by digging with his horns, and turning it aside with his feet. In summer, he prefers the buds and leaves of trees to herbs, which the projecting branches of his horns permit him not to browse with ease. He runs on the snow, into which the breadth of his feet prevents him from sinking. . . . . These animals are extremely gentle, and are kept in flocks, which bring great profits to their owners. The milk, the skin, the sinews, the bones, the hoofs, the horns, the hair, the flesh, are all useful articles. The richest Laplanders have flocks of four or five hundred; and the poorest have ten or twelve. They are led out to pasture, and, during the nignt, they are shut up in inclosures, to protect them from the wolves. When carried to another climate, they soon die. Steno prince of Sweden sent

* Hist. de Gentibus septent. Autore Olao Magno, p. 205.

† Histoire de la Lapponie, traduite du Latin de Jean Scheffer, p. 205.

‡ Œuvres de Regnard, tom. i. p. 172.

some of them to Frederic duke of Holstein; and more recently, in the year 1533, Gustavus king of Sweden transmitted to Prussia ten male and female rein-deer, which were let loose in the woods. They all perished without producing, either in the domestic or free state. "I had a great desire," says M. Regnard, "to carry some live rein-deer to France. This experiment has been frequently tried in vain. Last year, some of them were brought to Dantzick, where, being unable to endure the heat of that climate, they perished."

In Lapland, there are both wild and domestic rein-deer. During the rutting season, the females are let loose into the woods, where they meet with wild males; and, as the latter are stronger and more hardy than the domestic kind, the breed from this commixture is better adapted for drawing sledges. These rein-deer are not so mild as the others; for they sometimes not only refuse to obey their master, but turn against him, and strike him so furiously with their feet, that his only resource is to cover himself with his sledge, till the rage of the animal abates. This carriage is so light, that a Laplander can turn it with ease above himself. The bottom of it is covered with the skins of young rein-deer, the hair of which is turned backward, to make the sledge advance easily up the mountains, and prevent its recoiling. The rein-deer is yoked by means of a collar, made of a piece of skin with the hair on it, from which a trace is brought under the belly between the legs, and

fixed to the fore part of the sledge. The only rein used by the Laplander is a cord tied to the root of the animal's horn, which he sometimes lays upon the one side of its back, and sometimes on the other, according as he wants it to turn to the right or the left. The rein-deer can travel, in this manner, at the rate of four or five leagues in an hour. But the quicker he goes, the motion becomes the more incommodious; and it requires much practice to be able to sit in the sledge, and to prevent it from overturning.

Externally, the rein-deer have many things in common with the stag; and the structure of their internal parts is nearly the same*. From this natural conformity, many analogous habits and similar effects result. Like the stag, the rein-deer annually casts his horns, and is loaded with fat. The rutting season of both is about the end of September. The females of both species go eight months with young, and produce but one fawn. During the rutting season, the males have an equal disagreeable odour; and some of the female rein-deer, as well as the hinds are barren †. The young rein-deer, like the fawns of the stag, are variously coloured; they are first red mixed with yellow, and afterwards

* Vide Rangifer. anatom. Barth. Act. 1671. No. 135.

† Out of a hundred females, not above ten are barren, and, on account of their sterility, are called *raones*. The flesh of these is very fat and succulent in autumn. — *Scheffer*, p. 20[illegible]

become of a blackish brown colour *. The young follow their mothers two or three years; and they acquire not their full growth till the end of the fourth year. It is at this age also that they are trained to labour. At the age of one year they are castrated, in order to make them tractable. The Laplanders perform this operation with their teeth. The uncastrated males are fierce, and very difficult to manage; and therefore, are not used for labour. To draw their sledges, the most active and nimble geldings are selected, and the heaviest are employed in carrying provisions and baggage. One unmutilated male is kept for every five or six females. Like the stags, they are tormented with worms in the bad season. About the end of winter, such vast numbers are engendered under their skin, that it is as full of holes as a sieve. These holes made by the worms close in summer; and it is only in autumn that the rein-deer are killed for their fur or their hide.

The flocks of rein-deer require much attention. They are apt to run off, and to assume their natural liberty. They must be followed, narrowly watched, and never allowed to pasture but in open places. When the flock is numerous, the assistance of several persons is necessary to keep them together, and to pursue

* The colour of their hair is blacker than that of the stag. . . . . The wild rein-deer are always stronger, larger, and blacker than the domestic kind. — *Regnard*, tom. i. p. 105.

those which run off. In order to distinguish them, when they wander into the woods, or mingle with other flocks, they are all marked. In fine, the time of the Laplanders is totally consumed in the management of their rein-deer, which constitute their whole riches, and they know how to derive all the conveniences, or rather the necessities, of life from these animals. They are covered from head to foot with their furs, which is impenetrable either by cold or water. This is their winter habit. In summer, they use the skins from which the hair is fallen off. They likewise spin the hair, and cover the sinews they extract from the animal's body with it. These sinews serve them for ropes and thread. They eat the flesh, and drink the milk, of which last they also make very fat cheese. The milk, when churned, instead of butter, produces a kind of suet. This singularity, as well as the great extent of their horns, and the fatness of the animal at the commencement of the rutting season, are strong indications of a redundance of nourishment. But we have still farther proofs that this redundance is excessive, or at least greater than in any other species; for it is peculiar to the rein-deer alone, that the female has horns as well as the male, and that, even when the males are castrated, they annually shed and renew their horns*. In the stag, the fallow

* Uterque sexus cornibus est. . . . . . Castratus quotannis cornua deponit. — *Linn. Syst. Nat.* p. 93. It is upon the authority of Linnæus alone that I have advanced this fact, of which I am unwilling to doubt; because, being a native of

deer, and the roebuck, who have undergone this operation, the horns remain always in the same condition they were at the time of castration. Thus, of all other animals, the rein-deer affords the most conspicuous example of redundant nutritive matter; and this effect is perhaps less owing to the nature of the animal than to the quality of his food *; for the substance of the *lichen*, or rein-deer liverwort, which is its only nourishment, especially during the winter, is similar to that of the mushroom, very nourishing, and contains a greater number of organic particles than the leaves or buds of trees †. This is the reason why

Sweden, and having travelled into Lapland, he had an opportunity of being well informed in every article regarding the rein-deer. I acknowledge, however, that the exception is singular, as, in all other animals of the deer kind, castration prevents the renewal of the horns. Besides, a positive testimony may be opposed to Linnæus. *Castratis rangiferis Lappones utuntur. Cornua castratorum non dicidunt, et cum hirsuta sunt, semper pilis luxuriant.* — Hulden, Rangifer. Jenæ, 1697. But Hulden, perhaps, advances this fact from analogy only; and the authority of such a skilful naturalist as Linnæus is of more weight than the testimonies of many people who are less informed. The known fact, that the female has horns like the male, is another exception, which gives support to the first; and it is still farther supported by the practice among the Laplanders, of not cutting away the testicles, but only compressing the seminal vessels with their teeth; for, in this case, the action of the testicles, which seems necessary to the production of horns, is not totally destroyed, but only weakened.

* See the article Stag.

† It is remarkable that, though the rein-deer eats nothing during winter, but great quantities of this moss, he always fattens better, his skin is cleaner, and his hair finer than

the rein-deer has larger horns and a greater quantity of fat than the stag, and why the females and geldings are not deprived of horns: it is also the reason why the horns of the rein-deer are more diversified in size, figure, and number of branches, than any other of the deer kind. Those males who have never been hunted or restrained, and who feed plentifully, and at their ease, upon this substantial nourishment, have prodigious horns, which extend backward as far as their crupper, and forward beyond the muzzle. The horns of the castrated males, though smaller, often exceed those of the stag; and those of the females are still smaller. Thus the horns of the rein-deer are not only subject to variation from age, like others of the deer kind, but from sex and castration. These differences are so great, in the horns of different individuals, that it is not surprising to see the descriptions given of them by authors so exceedingly different.

Another singularity, which is common to the rein-deer and the elk, must not be omitted. When these animals run, though not at full speed, their hoofs*, at each movement, make

when he feeds upon the best herbage, at which time he makes a hideous appearance. Their being unable to endure heat is the reason why they are better and fatter in autumn and winter, than in summer, when they have nothing but sinews, skin, and bone.—*Scheff. Hist. de la Lapponie*, p. 206.

* Rangiferum culex pipiens, œstrus tarandi, tabanus tarandi ad Alpes cogunt, crepitantibus ungulis.—*Linn. Syst. Nat.* p. 93. The feet of the rein-deer are shorter and much

a crackling noise, as if all their limbs were disjointed. The wolves, advertised by this noise, or by the odour of the animal, throw themselves in his way, and, if numerous, they seize and kill him; for a rein-deer defends himself against the attacks of a single wolf. For this purpose he employs not his horns, which are more hurtful than useful to him, but his fore-feet, which are very strong. With these he strikes the wolf so violently as to stun him, or make him fly off; and afterwards runs with a rapidity that prevents all farther attacks. The *rosómack*, or *glutton*, though not so numerous, is a more dangerous enemy. This animal is still more voracious, but not so nimble as the wolf. He pursues not the rein-deer, but lies in wait for it concealed in a tree. As soon as the rein-deer comes within his reach, he darts down upon it, fixes upon its back with his claws; and, tearing its head or neck with his teeth, he never quits his station till he has cut the animal's throat. He employs the same artifices, and carries on the same war

broader than those of the stag, and resemble the feet of the buffalo. The hoofs are cloven and almost round, like those of the ox. Whether he runs or goes slowly, the joints of his limbs make a great noise, like flints falling on each other, or like the breaking of nuts. This noise is heard as far as the animal can be seen. — *Scheffer*, p. 202. Fragor ac strepitus pedum ungularumque tantus est in celeri progressu, ac si silices vel nuces collidantur; qualem strepitum articulorum etiam in alce observavi. It is remarkable in the rein-deer, that all his bones, and particularly those of his feet, make a crackling noise, which is so loud, as to be heard as far as the animal can be seen. — *Regnard*, tom. i. p. 108.

against the elk, which is still stronger than the rein deer *. This *rosomack* or *glutton* of the North, is the same animal with the *carcajou* or *quincajou* of North America. His combats with the orignal of Canada are famous; and, as formerly remarked, the orignal of Canada is the same with the elk of Europe. It is remarkable, that this animal, which is not larger than a badger, should kill the elk, which exceeds the size of a horse, and is so strong as to slay a wolf with a single stroke of his foot †. But

* There is another animal, of a grayish brown colour, and about the size of a dog, which carries on a bloody war against the rein-deer. This animal, which the Swedes call *jaert*, and the Latins *gulo*, conceals itself in the highest trees, in order to surprise its prey. When he discovers a rein-deer, whether wild or domestic, passing under the tree where he is watching, he darts down upon its back, and, fixing his claws in the neck and tail, he tears and stretches with such violence as to break the animal's back, then sinks his muzzle into its body, and drinks its blood. The skin of the jaert is very fine and beautiful, and has even been compared to that of the sable.—*Œuvres de Regnard*, tom. i. p. 154. The caribou runs upon the snow almost as nimbly as upon the ground; because the broadness of its feet prevents it from sinking. The caribou, like the orignal, travels through the forests in winter, and is attacked in the same manner by the carcajou.—*Hist. de l'Acad. des Sciences, ann.* 1713, p. 14. *Note*, The carcajou is the same animal with the *jaert* or *glutton*.

† Lupi et ungulis et cornibus vel interimuntur vel effugantur ab alce; tanta enim vis est in ictu ungulæ, ut illico tractum lupum interimat aut fodiat, quod sæpius in canibus robustissimis venatores experiuntur.—*Olai Magni Hist. de Gent. Septent.* p. 135.

the fact is attested by such a number of authorities as render it altogether unquestionable *.

The elk and the rein-deer are both ruminating animals, as appears from their manner of feeding, and the structure of their intestines †;

* Quiescentes humi et erecti stantes onagri maximi a minima quandoque mustela guttur insiliente mordentur, ut sanguine decurrente illico deficiant morituri. Adeo insatiabilis est hæc bestiola in cruore sugendo, ut vix similem suæ quantitatis habeat in omnibus creaturis.—*Olai Magni Hist. de Gent. Sept.* p. 134. *Note,* 1. That Olaus by the word *onager,* often means the *elk*; 2. That with much impropriety, he compares the glutton to a small weesel; for this animal is larger than a badger. . . . The quincajou climbs trees, and, concealing himself among the branches, waits the approach of the orignal. When any of these animals come under the tree, the quincajou darts down upon its back, fixes his claws in its throat and rump, and then tears the creature's neck, a little below the ears, till it falls down.—*Descript. de l'Amerique Septentrionale, par Denys,* p. 329. The carcajou attacks and kills the orignal and caribou. In winter, the orignal frequents those districts where the *anagyris fœtida,* or stinking bean-trefoil, abounds; because he feeds upon it; and, when the ground is covered with five or six feet of snow, he makes roads through these districts, which he never abandons unless when pursued by the hunters. The carcajou, observing the route of the orignal, climbs a tree near a place where it must pass, darts upon it, and cuts its throat in a moment. In vain the orignal lies down on the ground, or rubs himself against the trees; for nothing can make the carcajou quit his hold. The hunters have found pieces of his skin, as large as a man's hand, sticking on the tree against which the orignal had dashed him. — *Hist. de l'Acad. des Sciences, ann.* 1707, p. 13.

† The elk, in its internal parts, and particularly in its bowels, and four stomachs, has a considerable resemblance to the ox.—*Mem. pour servir à l'Hist. des An.* part i. p. 184.

yet Tornæus Scheffer *, Regnard †, Hulden ‡, and several other authors, have maintained that the rein-deer does not ruminate. Ray §, with much propriety, considers this opinion as incredible; and, in fact, the rein-deer || chews the cud as well as all other animals which have many stomachs. The duration of life in the domestic rein-deer, exceeds not fifteen or sixteen years ¶. But it is probable, that, in a wild state, he lives much longer; for, as he is four years in acquiring his full growth, he ought, when in his natural state, to live twenty-eight or thirty years. The Laplanders employ different methods of hunting the wild rein-deer, corresponding to the difference of seasons. In the rutting time, they use domestic females to attract wild

* It is remarkable, that, though the rein-deer is cloven-footed, he does not ruminate.—*Scheffer*, p. 200.

† Regnard makes the same observation, tom. i. p. 109.

‡ Sunt bisulci et cornigeri, attamen non ruminant Rangiferi.—*Hulden, Rangiferi*, &c.

§ Profecto (inquit Peyerus) mirum videtur animal illud tam insigniter cornutum, ac præterea bisculum, cervisque specie simillimum, ruminatione destitui, ut dignum censeam argumentum altiore indagine curiosorum, quibus Renones fors subministrat aut principum favor. *Hactenus Peyerus*; mihi certe non mirum tantum videtur, sed plane incredibile. *Raii. Synops. Quadr.* p. 89.

|| Rangifer ruminat æque ac aliæ species sui generis.—*Linn. Faun. Suecica*, p. 14.

¶ Ætas ad tredecim vel ultra quindecim annos non excedit in domesticis.—*Hulden*. Ætas sexdecim annorum.—*Linn. Syst. Nat.* p. 67. Those rein-deer which escape all misfortunes and diseases, seldom live above thirteen years.—*Scheffer*, p. 209.

males *. They shoot these animals with muskets or with bows, and they let fly their arrows with such violence, that, notwithstanding the great thickness and strength of their skin, one is generally fatal.

We have collected the facts relating to the history of the rein-deer with the more care and circumspection, because it was not possible for us to procure the live animal. Having expressed my regret on this subject to some of my friends, Mr. Colinson, member of the Royal Society of London, a man as respectable for his virtues as for his literary merit, was so obliging as to send me a drawing of the skeleton of a rein-deer; and I received from Canada a fœtus of a caribou. By means of these two, and of several horns which were transmitted to us from different places, we have been enabled to mark the general re-

* The Laplanders hunt the rein-deer with nets, halberds, arrows, and muskets. The hunting seasons are autumn and spring. In autumn, when the rein-deer are in season, the Laplanders go to those places of the forests which they know the wild males frequent, and there tie domestic females to the trees. The female attracts the male, and, when he is at the point of covering her, the hunter shoots him with a bullet or an arrow. . . . . In spring, when the snow begins to melt, and these animals are embarrassed by sinking in it, the Laplander, shod with his rackets, pursues and overtakes them. . . . . At other times, they are chased into snares by dogs. In fine, a kind of nets are employed, which are composed of stakes wattled together in the form of two hedges, with an alley between them of perhaps two leagues in length. When the rein-deer are pushed into this alley, they run forward, and fall into a large ditch, made with that view at the end of it.— *Scheffer*, p. 209.

semblances and principal differences between the rein-deer and the stag.

With regard to the elk, I saw one alive about fifteen years ago. But, as it continued only a few days in Paris, I had not sufficient time to have the drawing completed; and, therefore, I was obliged to content myself with examining the description formerly given of this animal by the gentlemen of the Academy, and to be satisfied that it was exact, and perfectly conformable to nature.

"The elk," says the digestor of the Memoirs of the Academy*, "is remarkable for the length of its hair, the largeness of its ears, the smallness of its tail, and the form of its eye, the largest angle of which is much split, as well as the mouth, which is much larger than that of the ox, the stag, or other cloven-footed animals. . . . . The elk which we dissected was nearly of the size of a stag. The length of the body was five feet and a half from the end of the muzzle to the origin of the tail, which was only two inches long. Being a female, it had no horns; and its neck was only nine inches in length, and as much in breadth. The ears were nine inches long by four broad. . . . . The colour of the hair was not much different from that of the ass, the gray colour of which sometimes approaches to that of the camel. . . . . In other respects, this hair differed greatly from that of the ass,

* Mem. pour servir à l'Histoire des Animaux, part i. p. 178.

which is shorter, and from that of the camel, which is much finer. The length of the hair was three inches, and equalled in thickness the coarsest hair of a horse. This thickness diminished gradually toward the extremity, which was very sharp: it diminished likewise toward the root, but suddenly became like the handle of a lancet. This handle was of a different colour from the rest of the hair, being white and diaphanous, like the bristles of a hog. . . . . The hair was as long as that of a bear, but straighter, thicker, smoother, and all of the same kind. The upper lip was large and detached from the gums, but by no means so large as Solinus described it, nor as Pliny has represented the animal he calls *machlis*. These authors tell us, that this creature is obliged to go backward when he pastures, to prevent his lip from being entangled between his teeth. We remarked, in the dissection, that Nature had provided against this inconveniency by the largeness and strength of the muscles destined to raise the upper lip. We likewise found the articulations of the legs closely embraced by ligaments, the hardness and thickness of which might give rise to the opinion, that the *alce*, after lying down, was unable to raise himself. . . . . His feet were similar to those of the stag, without any other peculiarity than that of being larger. . . . . . We remarked, that the large angle of the eye was much more slit below than in the stag, the fallow deer, and the roebuck: it is sin-

gular, that this slit was not in the direction of the opening of the eye, but made an angle with the line which goes from the one corner of the eye to the other; the inferior lachrymal gland was an inch and a half long, by seven lines broad. . . . . . . In the brain we found a part whose magnitude seemed to point out some relation to the sense of smelling, which, according to Pausanias, is more exquisite in the elk than in any other animal; for the olfactory nerves, commonly called the *mammillary processes*, were incomparably larger than in any other animal we ever dissected, being more than four lines in diameter . . . . With regard to the lump of flesh which some authors have placed on his back, and others under his chin, if they have not been deceived or too credulous, it must be peculiar to the elks they mention." We can add our testimony to that of the gentlemen of the academy; for, in the female elk we had alive, there was no bunch either under the chin, or on the neck. Linnæus, however, as he lives in the country inhabited by elks, and ought to have a more complete knowledge of them than we can pretend to, mentions this bunch on the neck, and even makes it an essential character of the elk: *Alces, cervus cornibus acaulibus palmatis, caruncula gutturali.—Linn. Syst. Nat.* p. 92. There is no other method of reconciling the assertion of Linnæus with our negative evidence, but by supposing this bunch, *guttural caruncle*, to be peculiar to the male, which we have never seen.

But, though this were the case, Linnæus ought not to have made it an essential character of the species, since it exists not in the female. This bunch may likewise be a disease, a kind of wen, common among the elks; for, in Gesner's* two figures of this animal, the first, which wants horns, has a large fleshy bunch on the throat; and, in the second, which represents a male with his horns, there is no bunch.

In general, the elk is much larger and stronger than the stag or rein-deer†. His hair is so rough, and his skin so hard, that it is hardly penetrable by a musket ball‡. His limbs are extremely firm, and possess such agility and strength, that, with a single blow of his fore-feet, he can slay a man, or a wolf, and even

* Gesner, Hist. Quad. p. 1 et 3.

† The elk exceeds the rein-deer in magnitude, being equal to the largest horse. Besides, the horns of the elk are much shorter, about two palms broad, and have very few branches. His feet, especially those before, are not round, but long, and he strikes with them so furiously as to kill both men and dogs. Neither does he more resemble the rein-deer in the form of his head, which is longer, and his lips are larger and pendulous. His colour is not so white as that of the rein-deer, but, over the whole body, it is an obscure yellow, mixed with a cinereous gray. When he moves, he makes no noise with his joints, which is common to all rein-deer. In fine, whoever examines both animals, as I have often done, will remark so many differences, that he will have reason to be surprised how any man should regard them as the same species.—*Scheffer*, p. 310.

‡ Alces ungula ferit, quinquaginta milliaria de die percurrit, corium globum plumbeum fere eludit.—*Linn. Syst. Nat.* p. 93.

break a tree. He is hunted, however, by men and dogs, in the same manner as the stag. We are assured, that, when pursued, he often falls down suddenly*, without being either shot or wounded. From this circumstance it has been presumed that the animal is subject to the epilepsy; and from this presumption (which is not well founded, since fear might produce the same effect) the absurd conclusion has been drawn, that his hoofs have the power of curing, and even preventing, the falling sickness. This gross prejudice has been so generally diffused, that

* We had not advanced a pistol shot into the wood, when we descried an elk, which, when running before us, suddenly dropped down, without being so much as fired at. We asked our guide and interpreter how the animal came to fall in this manner. He replied, that it was the falling sickness, to which these animals are subject, and assigned that as the reason of their being called *ellends*, which signifies *miserable*. . . . If this disease did not often bring them down, it would be difficult to seize them. The Norwegian gentleman killed this elk while it was under the influence of its disease. We pursued another two hours, and would never have taken him, if he had not, like the first, fallen down, after having killed three strong dogs with his fore-feet. . . . This gentleman presented me with the left hind-feet of the elks he had killed, and told me they were a sovereign remedy against the falling sickness. To which I answered, smiling, that, since this foot had so much virtue, I was surprised that the animal to which it belonged should ever be afflicted with the disease. This gentleman likewise laughed, and said that I was right; that he had seen it administered without effect to many people who were troubled with the epilepsy; and that he knew, as well as I did, that it was a vulgar error. — *Voyage de la Martiniere*, p. 10.

many people still carry pieces of the elk's hoof in the collets of their rings.

As the northern parts of America are very thinly inhabited, all the animals, and particularly the elks, are more numerous there than in the North of Europe. The Savages are not ignorant of the art of hunting and seizing the elks *. They sometimes follow the tract of these animals for several days, and, by mere perseverance and address, accomplish their purpose. Their mode of hunting in winter is particularly singular. "They use," says Denys, "rackets, by means of which they walk on the snow without sinking. . . . . The orignal does not make much way, because he sinks in the snow, which fatigues him. He eats only the annual shoots of trees. Where the Savages find the wood eaten in this manner, they soon meet with the animals, which are never very distant, and are easily taken, because they cannot run expeditiously. They throw darts at them, which consist of large staves, pointed with a bone, which pierces like a sword. When there are many orignals in a flock, the Savages put them to flight. The orignals, in this case, march at one another's tails, and make a circle sometimes of more than two leagues, and, by their frequent turning round, tread the snow so hard, that they no longer sink in it. The Savages lie in ambuscade, and kill the animals with darts as they

* Descript. de l'Amerique, par Denys, tom. ii. p. 425.

Plate 246

Warner Sc

ELK. *Male*.

pass." From comparing this relation with those already quoted, it is apparent, that the American Savage and the orignal are exact copies of the European Laplander and the elk.

We have designed and engraved the figure of a young elk, which we saw alive at the fair of Saint-Germain, in 1784, it was not three years old, the buds of its antlers were but two inches high, the last having been shed the beginning of January of the same year: as it appeared to me necessary to give an idea of the antler, when the animal is full grown, I have represented it on its head. This young elk was caught fifty leagues beyond Moscow; and, from the report of his keeper, its mother was nearly twice as large when three years old. It was already larger than a stag, and stood much higher on its legs: but it had not the elegant form of the stag, nor the noble and elevated position of the head. What seems to oblige the elk to stoop its head is, that, independent of the specific gravity of its large antlers, it has a very short neck. In the stag, the hind quarter is higher than the fore; in the elk, on the contrary, the fore quarter is the highest, and, what appears still to increase the height of the fore part of the body is, a thick fleshy part on the back, above the shoulders, which is covered with black hair.

The legs are long and light, the fetlocks large, especially those behind: the feet are very strong, and the hoofs, which are black, touch each other at their extremity, which is thin and round. The two false hoofs of the fore-feet are two

inches nine lines in length; they are long, straight, and flat, and do not touch, but their end almost reaches the ground; those of the hind-feet measure, in a straight line, two inches nine lines; they are flat, crooked, raised two inches five lines above the ground, and touch behind the fetlock. The tail is very short, being merely a stump covered with hair.

The head is of a long shape, rather flat at the sides; the frontal bone is hollow between the eyes: the top of the nose is a little swelled; the end is large, flat, and rather grooved in the middle: the nose and nostrils are grayish. The opening of the mouth, in a straight line, measures four inches three lines: it has eight cutting teeth in the lower jaw, and none in the upper.

The eye projects; the iris is of a chesnut brown; the pupil, when it is half closed, forms an horizontal line; the upper eye lid is arched, and garnished with black hairs; the inner angle of the eye is open, and, in lengthening itself, forms a sort of *larmier*. The ear is large, erect, and terminates in a round point. It is of a blackish brown above, and garnished within with long grayish hairs on the upper part, and blackish brown beneath. Beneath the jaws we remarked a great tuft of black hair; the neck is large, short, and covered with long black hairs above, and reddish gray beneath. The body of this young animal is of a deep brown colour, mixed with tawny and gray: it was almost black on the feet and the pastern, as

well as on the neck, and the fleshy part above the shoulders. The longest hairs measured five inches ten lines; on the neck they were six inches six lines; on the back three inches: those on the body were gray at the root, brown in the middle, and tawny at the tip.

Several travellers have pretended that, in North America, there exist elks of a much larger size than those of Europe, and even of the common ones of America. Mr. Dudley *, who sent the Royal Society of London a description of the orignal, says that the hunters killed one more than ten feet high.

Josselyn † asserts that, in North America, elks are found of twelve feet in height. The travellers who have mentioned these gigantic elks, make the length of their antlers six feet, and, according to Josselyn, their tips are two fathoms, or from ten to eleven feet asunder. Le Hontan says, that there is the antler of an elk in America, that weighs between three and four hundred pounds ‡. All these relations may be exaggerated, or be founded only on the vague reports of the Savages, who pretend that, seven or eight hundred leagues to the south-west of Fort York, there exists a species of elk, much larger than the common kind, and which they call *waskesser*; but what, however, may make us presume that these relations are not absolutely

* Phil. Trans. for the year 1721.

† Josselyn. Voy. New. Eng. p. 88.

‡ Voy. N. Amer. i. p. 57.

false is, that in Ireland they find a great quantity of enormous fossil bones, which are attributed to the great elks of North America, mentioned by Josselyn *; because no other known animal can be supposed to have such large and heavy antlers. These antlers differ from those of the European elks, or of the common American elks, in the heads, which are longer in proportion; and they are furnished with larger and thicker antlers, especially in the upper part. One of these fossil antlers, composed of two heads, was five feet five inches long, from its insertion in the skull to the point; the antlets were eleven inches long, the top of the head eighteen inches broad; and the distance between the two ends, seven feet nine inches; but this enormous antler was nevertheless very small in comparison with others that have been found also in Ireland. Mr. Wright has figured one of these horns that was eight feet long, the two ends of which were fourteen feet apart. These very large fossil antlers have perhaps belonged to a species which has not subsisted for a long time, neither in the Old Continent nor in the New World; but if individuals similar to those which bore these enormous horns still exist, we may believe that they are the elks which the Indians have named *vashesser*; and then the relations of Dudley, Josselyn, and La Hontan, will be completely confirmed.

* Voy. N. Engl. p. 83.

Addition to the article Elk and Rein-deer, by Professor Allamand.

M. de Buffon is of opinion, that the European elk is likewise found in North America under the appellation of *orignal.* If any difference exists, it consists in magnitude only, which varies in proportion to climate and food. It is not even ascertained which of them is largest. M. de Buffon thinks that the orignals of Europe are larger than those of America, because all the animals of the New Continent are smaller than those of the Old. Most voyagers, however, represent the orignal as exceeding the elk in magnitude. Mr. Dudley, who sent an accurate description of an orignal to the Royal Society, says, that the hunters killed one which was more than ten feet high *. This stature would be necessary to enable the animal to carry its enormous horns, which weigh one hundred and fifty, and, if we believe La Hontan, three or four hundred pounds.

The duke of Richmond, who delights in collecting, for public utility, every thing that can contribute to improve the arts, or augment our knowledge of Nature, has a female orignal in one of his parks, which was conveyed to him by general Carlton, governor of Canada, in the year 1766. It was then only one year old, and it lived nine or ten months. Some time before it

* Phil. Trans. ann. 1721, No. 368, p. 165.

died, he caused an exact drawing of it to be made, which he obligingly sent to me, and of which I have given an engraving as a supplement to M. de Buffon's work. As this female was very young, it exceeded not five feet in height. The colour of the upper part of the body was a deep brown, and that of the under part was brighter.

I received from Canada the head of a female orignal which was more advanced in years. Its length, from the end of the muzzle to the ears, is two feet three inches. Its circumference at the ears is two feet eight inches, and, near the mouth, one foot ten inches. The ears are nine inches long. But, as this head is dried, these dimensions must be smaller than when the animal was alive.

M. de Buffon is likewise of opinion, that the caribou of America is the rein-deer of Lapland; and the reasons with which he supports this idea have much weight. I have given a figure of the rein-deer, which is wanting in the Paris edition. It is a copy of that which was published by Ridinger, a famous painter and engraver, who drew it from the life. I have likewise been obliged to the duke of Richmond for a drawing of the American caribou. This animal was sent to him from Canada, and it lived a long time in his park. His horns were only beginning to shoot when the figure was drawn; and it is the only true representation we have of the animal. By comparing it with the rein-deer, there appears at first sight, to be a very considerable dif-

Plate 247

A Bell Sculp.

FEMALE REIN-DEER.

ference between the two figures; but the want of horns in the caribou greatly changes its aspect.

Addition by the Count de Buffon.

I here give an engraving of a rein-deer, drawn from a living female in the possession of the prince of Condé. It was sent to him by the king of Sweden, along with two males, one of which died on the road, and the other lived only a short time after its arrival in France. The female resisted the effects of the climate for a considerable time. She was of the size of a hind; but her legs were shorter, and her body thicker. Her horns, like those of the male, were divided into antlers, some of which pointed forward, and others backward. But they were shorter than those of the males. The following description of this animal was communicated to me by M. de Sève:

"The length of the whole body, from the muzzle to the anus, in a superficial line, is five feet one inch. The height of the withers is two feet eleven inches, and that of the crupper two feet eleven inches nine lines. The hair is thick and close, like that of the stag, the shortest on the body being an inch and three lines in length. It is longer on the belly, very short on the limbs, and very long about the fetlock. The colour of the hair which covers the body is a reddish brown, more or less deep in different parts, and sprinkled

with a kind of yellowish white. Upon part of the back, the thighs, the top of the head, and chanfrin, the hair is deeper coloured, especially above the eye-pits, which the rein-deer has as well as the stag. The circumference of the eye is black. The muzzle is a deep brown, and the circumference of the nostrils is black. The point of the muzzle, as far as the nostrils, as well as the end of the under jaw, are of a bright white colour. The ear is covered above with thick white hair, approaching to yellow, and mixed with brown. The inside of the ear is adorned with large white hairs. The neck and upper part of the body, as well as the large hairs which hang on the breast below the neck, are of a yellowish white colour. Upon the sides, above the belly, there is a large band, as in the gazelle. The limbs are slender in proportion to the body; and they, as well as the thighs, are of a deep brown and of a dirty white colour on the inside. The ends of the hairs which cover the hoofs are likewise of a dirty white. The feet are cloven, like those of the stag. The two fore toes are broad and thin: the small ones behind are long, pretty thin, and flat on the inside. They are all extremely black."

By the figure I have given, no judgment must be formed of the length and thickness of the rein-deer's horns, some of which extend backward from the head as far as the crupper, and project forward in antlers of more than a foot long. The large fossil horns found in different places, and particularly in Ireland, appear to have be-

longed to the rein-deer species. Mr. Colinson informed me that he had seen some of these fossil horns with an interval of ten feet between their extremities, and with brown antlers, like those of the rein-deer.

It is to this species, therefore, and not to that of the elk, that the fossil bones of the animal called *moose-deer* by the British are to be referred. We must acknowledge, however, that no rein-deer now exist of such magnitude and strength as to carry horns so long and massy as those found in a fossil state in Ireland, as well as in several other parts of Europe, and even in North America *.

Besides, I knew only one species of rein-deer, to which I referred the caribou of America, and the Greenland fallow deer, described and engraven by Mr. Edwards: and it is not long since I was informed, that there were two species, or rather two varieties, the one much larger than the other. The rein-deer of which I have given a figure, is the small kind, and probably the same with the Greenland fallow deer of Mr. Edwards.

Some travellers tell us, that the rein-deer is the fallow deer of the North; that, in Greenland, it is wild; and that the largest of them exceed not the size of a two year old heifer †.

* In North America, we find horns which must have belonged to an animal of a prodigious magnitude. Similar horns are found in Ireland. They are branched, &c.—*Voyage de P. Kalm*, tom. ii. p. 435.

† Hist. Gen. des Voyages, tom. xix. p. 37.

Pontoppidan assures us, that the rein-deer perish in every part of the world, except the northern regions, where they are even obliged to inhabit the mountains. He is less to be credited when he tells us, that their horns are moveable; that the animal can turn them either forward or backward; and that, above the eyelids, there is a small aperture in the skin, through which he sees, when the snow prevents him from opening his eyes. This last fact appears to be imaginary, and borrowed from a practice of the Laplanders, who cover their eyes with a piece of split wood, to avoid the great splendour of the snow, which renders them blind in a few years, if this precaution is neglected *.

It is renarkable, that these animals, in all their movements, make a crackling noise: independent of running, even when surprised or touched, this noise is heard. I have been assured that the same thing happens to the elk; but I cannot ascertain the truth of this assertion.

Observations on the Rein-deer, by Professor Camper of Groningen.

The rein-deer sent to me from Lapland by the way of Drontheim and Amsterdam, arrived at Groningen the 21st day of June, 1771. It was very feeble, not only on account of the heat

* Pontoppidan's Nat. Hist. of Norway.

of the climate and the fatigue of the voyage, but chiefly from an ulcer between the second stomach and the diaphragm, of which it died the next day. While it lived, it eat, with appetite, grass, bread, and other things presented to it, and likewise drank very copiously. It did not die for want of nourishment; for, upon dissection, I found all its stomachs full. Its death was slow, and accompanied with convulsions.

It was a male of four years old. In all the bones of the skeleton, there were epiphyses, which proves that it had not yet acquired its full growth, which happens not till five years of age. Hence this animal may live at least twenty years.

The colour of the body was brown, mixed with black, yellow, and white. The hairs on the belly, and particularly on the flanks, were white, and brown at the points, as in other deer. The hair on the limbs was a deep yellow; and that on the head inclined to black. The hair on the flanks, as well as on the neck and breast, was long and bushy.

The hair which covered the body was so brittle, that, when slightly pulled, it broke transversely. It lay in an undulated form, and its substance resembled the pith of rushes. The brittle part of it was white. The hair on the head and the under part of the legs, as far as the hoofs, had not this fragility, but, on the contrary, was as strong as that of a cow.

The coronet of the hoofs was covered on all sides with very long hair. Between the toes of

the hind-feet there was a broad pellicle, composed of the skin which covers the body, but interspersed with small glands.

In the hind-feet, at the height of the coronets, a kind of canal, sufficient to admit a goose quill, and filled with very long hairs, penetrated as far as the articulation of the canon with the small bones of the toes. I discovered no such canal in the fore-feet; neither do I know the use of it.

The figure of this animal differed much from that described by other authors, because it was extremely emaciated. The length of the body, from the muzzle to the anus, was five feet, and its height before three feet.

The eyes differ not from those of the fallow deer or stag. The pupil is transverse; and the iris is brown, inclining to black. The eye-pits resemble those of the stag, and are filled with a whitish, resinous, and somewhat transparent matter. As in the fallow deer, there are two lachrymal ducts and canals. The upper eyelid has very long black *cilia*. It is not perforated, as some authors have fancied, but entire. The bishop of Pontoppidan, and, upon his authority, Mr. Haller, have attempted to account for this supposed perforation: they thought it necessary, in a country perpetually covered with snow, to defend the animal's eyes against the excessive glare of reflected light. Man, who is destined to live in all climates, prevents blindness as much as possible by veils or small perforated machines, which weaken the splendour of the light. The rein-deer, who is made for

this climate alone, has no occasion for such mechanism. But he is furnished with a nictitating membrane, or an internal eyelid, like the birds, and some other quadrupeds. Neither is this membrane perforated: it is capable of covering the whole cornea.

The nose of the rein-deer is very large, like that of the cow; and the muzzle is more or less flat, and covered with long grayish hair, which extends to the internal part of the nostril. The lips are likewise covered with hair, except a small border, which is blackish, hard, and very porous. The nostrils are very distant from each other. The under lip is narrow, and the mouth deep cut, as in the sheep.

He has eight cutting teeth in the under jaw; but they are very small, and loosely fixed. Like the other ruminating animals, he has no cutting teeth in the upper jaw. But I thought I perceived tusks, though they had not yet pierced the gums; and I observed no such appearance in the under jaw. Horses have tusks in both jaws; but mares seldom have any. The fallow deer, both males and females, seldom or never have tusks. But I lately procured the head of a hind recently brought forth, which had a large tusk in the left side of the upper jaw: nature is so various in this article, that no constant rule can be established. There are six grinders in each side of both jaws, or twenty-four in all.

I have nothing to remark concerning the horns; for they were only beginning to shoot: one of them was an inch, and the other an

inch and a half high. Their base was situated nearer the occiput than the orbit of the eye. The hair which covered them was beautifully turned, and of a gray colour, inclining to black. In viewing the two shoots at a distance, they had the appearance of two large mice sitting on the animal's head.

The neck is short, and more arched than that of the sheep, but less than that of the camel. The body seemed to be naturally robust. The back is a little elevated toward the shoulders, and pretty straight every where else, though the vertebræ are somewhat arched.

The tail is very small, bent downward, and garnished with long bushy hair.

The testicles are very small, and appear not without the body. The penis is not large. The prepuce is naked, like a navel, full of wrinkles in the inside, and covered with a calcareous crust.

The hoofs are large, long, and convex on the outside. The spurs are also very long, and some of them touch the ground when the animal stands. They were hollow, probably because he makes no use of them.

The intestines were exactly similar to those of the fallow deer. There was no gall-bladder. The kidneys were smooth, and undivided. The lungs and windpipe were very large.

The heart was of a middle size, and, like that of the fallow deer, contained one small bone only. This bone supported the base of the semilunar valve of the aorta, which is opposed to two others,

from which the coronary arteries of the heart derive their origin. It likewise gives firmness to the membranous partition between the two cavities of the heart, and to the triglochine valve of the right ventricle.

In this animal there is a singular pouch, very large, membranous, and situated under the skin of the neck. It begins by a conical canal between the os hyoides and the thyroide cartilage. This canal gradually enlarges, and is changed into a kind of membranous sac, supported by two oblong muscles, which derive their origin from the inferior part of the os hyoides, precisely where the base, the pisiform bone, and the cornua unite.

This pouch opens into the larynx, under the root of the epiglottis, by a large orifice, which easily admitted my finger.

When the animal pushed the air forcibly out of the lungs, as in lowing, the air passed into this pouch, swelled it, and necessarily produced a considerable tumour, which greatly changed the sound. The two muscles drive the air out of the pouch, when the animal ceases its lowing.

About twenty years ago, I showed a similar pouch in several baboons and monkeys; and, the year following, I demonstrated to my pupils, that there was a double pouch in the ourang-outang *.

* Elks abound in Russia, in the neighbourhood of the river Samara: in winter they feed on the young shoots, and the bark of the aspin and poplar, which grow there in abundance,

Extract of a Letter from M. le Comte de Mellin, Chamberlain to the King of Prussia, dated from the Chateau of Anazou, near Stettin, November, 15, 1784.

"I have again the honour to communicate to M. le Comte, the engraving of a male rein-deer, which I have painted after nature: that of

and afford them a delightful shade in summer, besides a better subsistence than they can find on the vast mountains and wild heaths of that country. They often have recourse to water plants, particularly a high grass which grows on the bed of rivers. They are said to be very fond of the *anagyris fœtida* or stinking bean trefoil, and will dig in the snow with their feet to procure it. In summer, they frequently go up to their necks in water, to escape the innumerable insects that torment them. The Vogouls hunt these animals for the sake of their flesh, which, after it has been dried in the air and smoked, constitutes the principal food of those people. They pay their tribute with the skins, which also serve them for many domestic purposes.

The drawing from which Bewick has engraved his rein-deer, was taken from the living animal in the possession of sir H. C. Liddell. This gentleman brought five from Lapland, in 1786, and doubled the number on the following year. Bewick tells us they produced young ones, and gave promising hopes of thriving in this country; but unfortunately some of them were killed, and others died in consequence of a disorder similar to the rot in sheep.

The rein-deer, when taken young, is very easily tamed, and will even become familiar and affectionate. Cartwright, who lived for several years on the coast of Labrador, has given us a proof of this in his account of a tame rein-deer, whose attachment and fidelity equalled that of a dog.

W.

the female and the fawn, I daily expect from my engraver; I shall have the honour to send you an impression, if you desire it. The rein-deer, when I painted it, was but two years old, and bore its second horns; therefore, they were not so large in the grasp, and were provided with fewer pegs, or antlets, than the same rein-deer carry at present. It must also be remarked, that the engraver has done wrong in giving to the pendent beard of the rein-deer, the figure of a mane, which we should say descended from the opposite side. If I can please you, sir, by the miniatures of these animals, painted in colours with great care, I will send them to you with much satisfaction. . . . The Marcgrave of Brandeburg Schwedt, Frederic Henry, cousin to the king of Prussia, obtained them from Sweden and Russia, and has permitted me to design, measure, and to study them. In the Memoirs of the Berlin Society, I have published, in German, the observations which I have made, and of which I have the honour to communicate the substance to you. There are, M. le Comte, as you remark, two species, or rather two varieties of rein-deer, one much larger than the other; I know them both. The difference between these two species is also as remarkable as between the stag and the fallow deer. The g eat rein-deer, which are as large as stags, were sent from the province *Mezeu*, in the government of Archangel, a province renowned for the finest and largest rein-deer of all Russia: there are two males and two females. Two females and a male came

from Sweden, which were hardly larger than our fallow deer, that is to say, the females; for the male died on its passage. . . . .

"What is very remarkable, but not mentioned, however, by any naturalist is, that the fawns of the rein-deer are born with studds, and, when fifteen days old, have little rudiments an inch long, which shoot into horns soon after those of their mother. . . . . . The fawns of the Russian rein-deer have horns a foot long, and each head has three antlers, while those of Sweden have the first horns shorter, and separated at the end into two antlers. The figure of the Greenland fallow deer, by Edwards, seemed to me to be that of a fawn of three months. It is singular that the females, which were pregnant when they arrived, and which, for the three years since they came from Schwedt, have brought forth a fawn each year, have produced only females; therefore I cannot say if the male fawns bear horns longer and more loaded with antlers than the females, but we may presume as much when we consider the great difference between the horn of the male and that of the female. The fawns are born in the months of June and July, without their proper livery; they are brown, deeper on the back, and redder at the feet, the neck, and the belly; however, this colour darkens every day; and, at the end of six weeks, the back, shoulders, sides, beneath the neck, forehead, and nose, are of a gray black; the rest is yellowish, and the feet tawny. I have said that the fawns shoot their antlers soon after their mother: that hap-

pens in the month of November, and at that time the rut commences.

" The male rein-deer pursue the females long before they can enjoy them. These Russian females came in season fifteen days before those of Sweden: there was even a female of the Russian fawns, which, although scarcely five months old, took the male in November, and had a fawn the following year, as large as the others. This proves that the parts of generation in the rein-deer are unfolded sooner than in any other animal of its size: perhaps, also, the greater heat of our climate, and the abundance of food they enjoy, hastens the growth of these rein-deer. However, do not the horns which the female rein-deer bear at the age of five months, indicate a superabundance of organic molecules, which may cause a more prompt unfolding of the parts of generation? The male fawns may also be in a state to engender at the same age. The male rein-deer that I observed, behaved, during the rut, more like a fallow deer than a stag. In approaching the female, he caressed her with his tongue, tossed up his head, and brayed like the fallow deer, but with a weaker, though harsher, voice. He, at the same time, puffed out his thick lips, and, in expelling the air, made them quiver against the gums; then he stooped his hind-legs, and I supposed that he would then cover the female, who seemed also to be waiting for him; but, instead of that, he emitted a great quantity of seminal fluid without stirring; after which, he was for some minutes as if he had

lost the use of his hind legs, and walked with difficulty. I never saw them cover in the day time, but always at night. They took it slowly, and not flying, like the stags and fallow deer, as I have often observed in my park and woods, leaping on the does while running, stopping them, and sometimes squeezing them so roughly, that their false hoofs have been driven through the skin, and bathed their sides in blood. The rut begins in the middle of October, and it ends at the end of November. The male reins during this time have an extremely strong goatish smell.

"We have tried ineffectually to make the rein-deer cover does, or fallow deer. The first rein which came from Schwedt, was for several years without females, and, as it appeared to feel the impressions of heat, we enclosed her with two does and a fallow deer in a park, but he did not go near them. The following year we presented cows to him, but he constantly refused them, though he attacked women; and the more he advanced in age, the more furious he became, during the rutting time. He not only gave violent blows with his horns, but struck most dangerously with his fore-feet. I remember that one day, the rein-deer left the town of Schwedt, and was walking in the fields, when he was attacked by a butcher's dog; but, without taking to flight, he reared up, and gave the dog such a violent blow with his fore-feet, that he knocked him down on the spot: he had no antlers at that time. The antlers fall from the males towards Christmas, and at the begin-

ning of the year, according to their age, and they are renewed by the month of August. The females, on the contrary, shed in May, and are refitted in October; their antlers are therefore completely renewed at the end of five months, instead of eight, as in the males: the males also, more than five years old, have the antlers of a prodigious length; the sur-antlers have large grasps, as well as high heads, but they are of a less size, and more brittle than those of the stag or fallow deer. It is perhaps also to guard them the more when soft, that Nature has covered them with a much thicker skin than in the stag, for the new horn of the rein-deer is much thicker than that of the stag, and yet, when it shoots, the heads are much thinner. The rein-deer does not wound with his antlers like the stag, but strikes up and down with the palm of the horns, as Gaston Phæbus has previously well observed, in his description of the *rangier*, p. 97 of the Venerie de Dufouilloux. . . . . All who have given the history of the rein-deer, pretend that the milk drawn from the females will not yield butter. I think that depends on the food, or the manner of treating the milk. I caused three reins to be milked at Schwedt, and found the milk excellent, having the taste of nuts. I took it with me in a bottle for a relish, and was very much surprised to find on my arrival, that the shaking of my voiture, during the three hours' journey between Schwedt and my chateau, had changed the milk into butter. It was as white as that of the sheep, and of an admirable taste. I think, then, from this experiment, that I can

assert that the milk of the rein-deer will yield very good butter, if it be first beat after being drawn; for mine was only from the pure cream. They say, in Sweden, that the milk of the rein-deer has a rank and disagreeable flavour; I have proved the contrary, but the Swedish pasture is very inferior to that of Germany. Here the rein-deer feed on pastures of clover, and are nourished with barley, for they constantly refuse oats; it is but rarely that they give them the *lichen rangiferinus*, a small quantity of which grows in our woods, and they eat it voraciously. I have remarked that the crackling the rein-deer make in walking, is caused only by the edges of the hoofs which strike, and by the ergots (false hoofs) knocking against the hoofs. We may be easily convinced of this by putting a line between the edges of the hoofs, and by securing the false hoofs also; then all the cracking ceases. I thought, like every body else, that this cracking was formed between the fetlock and the knee; although that appeared to me hardly possible: but a tame stag which I had in my park made a similar cracking, when it followed me on the mossy ground, or the gravel, but duller; and I very distinctly saw, on a near inspection, that it was the edges of the hoofs, which, in clacking one against the other, made the noise. By repeating this observation on the rein-deer, I am convinced that it is the same with them. I also remarked that, without walking, they made the same cracking when they were surprised, or alarmed, by being suddenly touched, but that is occasioned by their constantly keeping their hoofs distantly

separated when they stand upright; and that, as soon as they are alarmed, or raise their foot to walk, they suddenly join the edges of the hoof and crackle. Finally, it is a very remarkable circumstance for a naturalist, that these rein-deer are preserved and multiply in a country where the temperature of the climate is much gentler than in their own: in a country, where snow is not common, and the winters much less rigorous; while they have previously in vain attempted, since the sixteenth century, to naturalize them in Germany, though there the climate is harsher, and the winters more severe. Frederick the First, king of Prussia, received some from Sweden, which died some months after their arrival; and yet, at that time, they had in Pomerania, and in the Marche, as well as in the environs of Berlin, many more marshes and woods, and it was therefore much colder than at present. It is now five years that these rein-deer have subsisted at Schwedt, and being in the neighbourhood of this little town, and his royal highness allowing me to come often, I have had frequent opportunities to observe and study them, and all I have had the honour to tell you on the subject, is the fruit of repeated observations."

Extract of a Letter from the Chevalier de Buffon, to the Count de Buffon.

Lille, May 30th, 1785.

"Three rein-deer have arrived here; namely, a male, aged six years, a female, aged three years, and a young female, one year old. The keeper, who shows them for money, asserts that he purchased them of a colony of Laplanders, called in Swedish *Deger Forth Capel*, in the province of *Wertubollo*, ninety miles (270 French leagues) from *Stockholm*, and eight miles (twenty-four leagues) from *Uma*: they were landed at Lubec last November. These three pretty animals are very familiar; the young one, especially, plays like a dog with those who caress it; they are fat, very lively, and very healthy.

"I have, with the book in my hand, compared these rein-deer with your description; it is perfect in all points. The male has an antler covered with down, like the young horn of the stag. This antler is very hot to the touch, each branch is seventeen inches long, from its origin to the end, where we begin to perceive two branches, which form a round, and not pointed head, like those of the stag. These two branches separate and curve forward, in the shape which I have represented

them; they are uniform, and of the finest growth; the two branches near the head

grow forwards; as they approach the nose of the animal, they become large and flat, with six antlets, the whole imitating the shape of a hand with six separate figures, and the rest of the horn produces many branches, almost all of which grow forwards, as well as I am able to judge from a very bad drawing which the master of the rein-deer gave me of the last antler which he sold in Germany. This horn was four feet high, and weighed seventeen pounds. The end of each branch is terminated by large pallets, bearing antlets like those near the head. The regularity and fine growth of the antler I saw, announced it to be superb.

"They eat hay, of which they choose the seed stalks; wild chicory, fruits, and rye bread, are their food, which they prefer to every other. When they wish to drink, they put a foot into the pail, and try to disturb the water, by stirring it: all three of them have the same habit, and almost always leave their foot in the pail when they drink.

"The female has two prominences, which indicate the birth of a new horn; the young one has the same: I have seen the antler of the female of the last year: it is not larger than the horn of a roe-deer; it is twisted, knotty, and each branch is of a very irregular shape.

"I have observed all the characters that you describe; the cracking of the hoofs when they walk, and particularly after rest; the long and whitish hair under the neck; their shape, which partakes of the ox and the stag; the head similar to that of the ox, as well as the eyes: the tail very

short, and resembling that of the stag; this rein-deer had neither the movements nor weight of the ox, nor the lightness of the stag; but it had all the vivacity of this last, tempered by its form, which is not so light. I have seen them ruminate: they fall on their knees to lie down. They are afraid of dogs: they fly from them, trying to strike them with their fore-feet. Their hair is tawny brown, the tawny declines to whitish under the belly, on both sides of the neck, and behind the crupper.

"Beneath the interior angle of each eye, we remarked a longitudinal opening, which would easily admit a quill: it is doubtless the *larmier* of these animals.

"The two spurs on each hind-leg are thick, and long enough for the pointed horn with which they are armed to drag on the ground when the animal walks: these spurs separate in this position; and the animal always marks four points in walking, of which the two behind enter four or five lines into the sand. This conformation may be very useful to them when travelling on the snow.

"The male is five feet six inches long, from the end of the muzzle to the origin of the tail; and three feet four inches high, from the sole of the foot to the withers.

"The female four feet six inches long, and three feet high.

"The young one, four feet one inch long, and two feet seven inches high: it grew visibly.

"They have six small cutting teeth, of the finest enamel, and very regular, at the anterior end of the lower jaw: five grinders on each side at the bottom of the mouth: there is the space of four fingers between the grinders and cutting teeth of each side, which is empty. The upper jaw has the same; and only five grinders on each side, as at the bottom of the mouth, but there are no cutting teeth. The rutting season is the same as that of the stag: the female was covered in the preceding November four leagues from Upsal.

"These remarks are long, and perhaps much too determined about animals which you know better than me, without having seen them; but as none have appeared alive in France till now, I thought that my observations might prove agreeable to you," &c.

THE WILD GOAT*, THE CHAMOIS GOAT†, AND OTHER GOATS.

THE Greeks, it is probable, were acquainted with the wild and chamois goats. But they have neither pointed out these animals by

* CAPRA.

CHARACTER GENERICUS.

concava, sursum versa, erecta, compressa,

I[illegible]*s primores* inferiores octo.
Laniarii nulli.
Mentum barbatum.

CHARACTER SPECIFICUS.

CAPRA IBEX.—C. cornibus supra nodosis in dorsum reclinatis, gula barbata.—*Linn. Syst. Nat. Gmel.* i. p. 196.

Capra cornibus lunatis rotundatis, supra nodosis, in dorsum reclinatis.—*Erxleb. Mamm.* p. 261.

Ibex alpium sibiricarum.—*Pallas Spic. Zool.* xi. p. 31, pl. 3.

IBEX.—*Plin. Hist. Nat.* viii. c. 53.—*Gesn. Quadr.* p. 331.—*Aldr. Bisulc.* p. 730, fig. 732.—*Jonst. Quadr.* p. 75, pl. 25—28.—*Ray's Quadr.* p. 77.

particular denominations, nor by characters so precise, as to enable us to distinguish them. They have denominated them in general, *wild*

STEINBOCK.—*Gesn. Thierb.* p. 148, cum fig. mediocr.—*Knorr. Delic.* ii. pl. K. 5, fig. 2. *cornu.*

IBEX. STEINBOCK.—*Mus. Lever.* No. 3, p. 105, pl. 2.

LE BOUQUETIN.—*Buff. Hist. Nat. par Sonn.* xxx. p. 201, pl. 9.

IBEX.—*Penn. Hist. Quadr.* i. p. 55.—*Bew. Quadr.* p. 76.—*Shaw's Gen. Zool.* ii. p. 364, pl. 198.

HABITAT

in alpibus Penninis, Italicis, Sibiricis, Kamtschaticis, &c. olim et in Helvetia, ubi hodie vix occurrit. Amat prærupta inaccessa. *W.*

The wild goat has large knotted horns, reclining bac' ward, and a very small head. On the chin of the male th is a dusky beard: the rest of the hair is tawny, mixed ash colour. The females are less, and have smaller more like those of the common she-goat, and have few on the upper surface. They bring one young, seldo at a time.—*Pennant's Synops. of Quad.* p. 13.

In French, *Bouquetin, Bouc estain, Boucestein*; th *rock-goat*, *stein* denoting *rock* in the Teutonic language; Latin, *Ibex*; in German and Swiss, *Steinbock*.

† CHARACTER SPECIFICUS ‡.

ANTILOPE RUPICAPRRA. A. cornibus erectis teretibus lævigatis, apice retrorsum uncinatis.—*Linn. Syst. Nat. Gmel.* i. p. 182.—*Schreb.* v. pl. 279.

Antilope (rupicapra) cornibus erectis uncinatis, corpore supra ferrugineo.—*Erxleb. Mamm.* p. 268.

‡ The chamois, though belonging to another genus, is here described as a goat, in conformity to the opinion of Buffon. The generic character will be found at the head of the Antelope. *W.*

goats *. They perhaps regarded these animals as of the same species with the domestic kind †,

Hircus (rupicapra) cornibus teretibus erectis rugosis, ad apicem lævibus et uncinatis. — *Briss. Regn. An.* p. 66.

Rupicapra. — *Plin. Hist. Nat.* viii. c. 53, ix. c. 37. — *Gesn. Quadr.* p. 321, fig. p. 319. — *Aldrov. Bisulc.* p. 725. fig. p. 727. — *Ray's Quadr.* p. 78.

Gems. — *Gesn. Thierb.* p. 140, cum fig. superiore mala, inferiore mediocri.

Eine Gembse. — *Ridinger*, pl. 12, fig. bona.

Le Chamois. — *Buff. Hist. Nat. par Sonn.* xxx. p. 201, pl. 9.

Chamois. — *Penn. Hist. Quadr.* i. p. 72. — *Bew. Quadr.* p. 71. — *Shaw's Gen. Zool.* ii. p. 361.

HABITAT

[illegible] alpibus Helveticis, Rhœticis præcique, Italicis, &c. [illegible]nis inaccessis gregaria. *W.*

[illegible] chamois goat has slender, black, upright horns, [illegible] at the end. Behind each ear there is a large orifice [illegible]in. The forehead is white, and along the cheeks [illegible] a dusky bar. The rest of the body is of a deep brown [illegible] The tail is short; the hoofs are long and much di- [illegible] — *Pennant's Synops. of Quad.* p. 17.

In Latin, *Rupicapra*; in Italian, *Camuza*; in German, *Gemss*; in old French, *Ysard, Ysarius, Sarris.*

Chamois, Cemas, Ysard; Obs. de Belon, p. 54. Belon pretends that the French name *Chamois* comes from the Greek *Cemas* of Ælian; but he is not certain that *Cemas*, or rather *Kemas*, denoted the Chamois; see *Mem. pour servir à l'Hist. des Animaux*, part i. p. 205.

* Rupicapras inter capras sylvestres adnumerare libet, quoniam hoc nomen apud solum Plinium legimus, et apud Græcos simpliciter *feræ capræ* dicuntur, ut conjicio: nam et magnitudine et figura tum cornuum tum figura corporis ad villaticas proxime accedunt. — *Gesner, Hist. Quad.* p. 292.

† Capræ quas alimus a capris feris sunt ortæ a queis propter Italiam, Capraria insula est nominata. — *Varro.*

having never bestowed on them proper names, as they have done to every other species of quadruped. Our modern naturalists, on the contrary, have considered the wild and the chamois goats as two distinct species, and both different from the common goat. There are facts and arguments in favour of both opinions, of which we shall only give a detail, till we learn from experience whether these animals can intermix together, and produce fertile individuals; as this circumstance alone can determine the question.

The male wild goat differs from the chamois in the length, thickness, and figure of his horns. His body is also larger, and he is more vigorous and strong. The horns of the female wild goat are smaller than those of the male, and have a great resemblance to those of the chamois*. Besides, the manners and dispositions of these two animals are the same, and they inhabit the same climate; only the wild goat, being stronger and more agile, goes to the summits of the highest mountains, while the chamois never rises higher than the second stage†. But neither of them are found in the plains. Both of them clear roads in the snow, and leap from one pre-

* Fœmina in hoc genere mare suo minor est, minusque fusca, major Capra villatica, Rupicapræ non adeo dissimilis: Cornua ei parva, et ea quoque Rupicapræ aut vulgaris capræ cornibus fere similia. — *Stumpfius, apud Gesner*, p. 305.

† Rupes montium colunt Rupicapræ, non summas tamen ut Ibex, neque tam alte et longe saliunt; descendunt alquando ad inferiora Alpium juga. — *Gesner, Hist.* p. 292.

cipice to another. Both are covered with a firm solid skin, and clothed, in winter, with a double fur, the external hair being coarse, and the internal finer and more bushy *. Both of them have a black band on the back, and tails of nearly an equal size. The number of external resemblances is so great, and the conformity of the internal parts is so complete, that we should be induced to conclude, that these two animals are not only simple, but permanent varieties of the same species. Besides, the wild, as well as the chamois goats †, when taken young, and reared along

* The chamois goat has longer legs than the domestic kind; but his hair is shorter. That which covers the belly and thighs is the longest, and exceeds not four inches and a half. On the back and flanks the hair is of two kinds; for, as in the beaver, beside the long external hair, there is a very short fine hair, concealed round the roots of the longer kind. The head, the belly, and the legs, were covered with coarse hair only. — *Mem. pour servir à l'Hist. des Animaux*, part i. p. 203.

† The inhabitants of the island of Crete might take the young of the bouc-estain (of which there are great numbers) wandering in the mountains, and feed and tame them along with the domestic kind. . . . They are covered with yellow hair. When old, they become gray, and a black line runs along the spine of the back. We have some of them in the mountains of France, and chiefly in places full of precipices, and of difficult access. . . . The bouc-estain leaps from one rock to another, at the distance of six fathoms. An exertion almost incredible to those who have not seen it. — *Observ. de Belon*, p. 14. Audio Rupicapras aliquando cicurari. — *Gesner, de Quad.* p. 292. Vaslesii ibicem in prima ætate captam omnino cicurari, et cum villaticis capris ad pascua ire et redire, aiunt; progressu tamen ætatis ferum ingenium non prorsus exuere. — *Stumpfius apud Gesner, Hist. Quad.* p. 305.

with the domestic kind, are easily tamed, assume the same manners, go in flocks, return to the same fold, and probably couple and produce together. I acknowledge, however, that this last fact, which is the most important of all, and would alone decide the question, is by no means established. We have never been able, with certainty, to learn whether the wild and chamois goats produce with the common kind *. We only suspect this to be the case. In this respect, we agree with the ancients; and, besides, our conjecture seems to be founded on strong analogies, which are seldom contradicted by experience.

Let us, however, consider the opposite arguments. The wild and chamois goats both subsist in the state of nature, and yet they always remain distinct. The chamois sometimes mingles spontaneously with the flocks of the do-

* In the compilation of natural history made by Messrs. Arnault de Nobleville and Salerne, it is said (tom. iv. p. 264), that the chamois goats are in season during almost the whole month of September; that the female goes with young nine months; and that they generally bring forth in June. If these facts were true, they would demonstrate that the chamois is not the same species with the goat, which goes with young about six months only: but I think they are suspicious, if not false. The hunters, as appears from the passages already quoted, assure us, on the contrary, that the chamois and wild goats do not come in season till the month of November; and that the females bring forth in May. Thus the time of gestation, instead of being extended to nine months, should be reduced to near five, as in the domestic goat. But this matter must be decided by experience alone.

mestic kind*; but the wild goat never associates with them, unless when tamed. The male wild goat and the common he-goat have very long beards, and the chamois has none. The horns of the male and female chamois are small: those of the wild he-goat are so large and so long†, that we could hardly imagine they belonged to an animal of his size. The chamois seems to differ from the wild goat and the common he-goat, by the direction of his horns, which incline a little forward in their inferior part, and bend backward at the point like a hook. But, as we remarked in the history of the ox and sheep, the horns of domestic animals, as well as those of wild animals living in different climates, vary prodigiously. The horns of our female goat are not entirely similar to those of the male. The horns of the male wild goat are not very different from those of our he-goat: and, as the female wild goat approaches the domestic kind,

* Rupicapræ aliquando accedunt usque ad greges caprarum cicurum quos non refugiunt, quod non faciunt ibices.—*Gesn. Hist. Quadr.* p. 292.

† Ibex egregium ut et corpulentum animal, species fere cervina minus tamen, cruribus quidem gracilibus et capite parvo cervum exprimit. Pulchros et splendidos oculos habet. Color pellis fuscus est. Ungulæ bisulcæ et acutæ ut in rupicapris; cornua magni ponderis ei reclinantur ad dorsum, aspera et nodosa, eoque magis quo grandior ætas processerit; augentur enim quotannis donec jam vetulis tandem nodi circiter viginti increverint. Bina cornua ultimi incrementi ad pondus sedecim aut octodecim librarum accedunt. . . . Ibex saliendo rupicapram longe superat; hoc tantum valet ut nisi qui viderit vix credat.—*Stumpfius apud Gesn.* p. 305.

and even the chamois, in size, and in the smallness of its horns, may we not conclude, that the males of the wild, chamois, and domestic goats, are only one species of animal, in which the nature of the females is constant and similar among themselves, but that the males are subject to considerable variations? In this point of view, which is not, perhaps, removed so far from nature as may be imagined, the wild goat would be the original male stock, and the chamois would be the female *. I say, that this point of view is not imaginary, since we can prove from experience, that there are animals in nature, in which the female can equally serve males of different species, and produce from them both. The sheep produces with the he-goat as well as with the ram, and always brings forth lambs which are individuals of its own species. The ram, on the contrary, produces not with the she-goat. The sheep, therefore, may be regarded as a female common to two different males; and, consequently, she constitutes a species independent of the male. The same thing will happen to the wild goat. The female alone represents the primitive species, because her nature is

* The want of a beard in the chamois is a female character, which ought to be added to the others. The male chamois appears, as well as the female, to participate of the feminine qualities of the she-goat. Thus it may be presumed, that the domestic he-goat would engender with the female chamois; and that, on the contrary, the male chamois could not engender with the female domestic goat. Time will verify or destroy this conjecture.

constant. The males, on the contrary, vary; and it is extremely probable, that the domestic she-goat, which may be considered as the same female as those of the wild and chamois kinds, would produce equally with these three different males, which alone admit of varieties in species; and, consequently, though they seem to change the unity, alter not the identity of the species.

These, as well as all other possible relations, must necessarily exist in Nature. It even appears, that the females contribute more to the support of the species than the males; for, though both concur in the first formation of the fœtus, the female, who afterwards furnishes every thing necessary to its growth and nutrition, modifies and assimilates it more to her own nature, and must, therefore, greatly efface the impression of the parts derived from the male. Thus, if we want to form a distinct judgment of a species, we ought to examine the females. The male bestows one half of the animated substance: the female gives an equal portion, and furnishes, besides, all the matter necessary for the developement of the form. A beautiful woman seldom fails to produce beautiful children, The offspring of a beautiful man with an ugly woman are generally still more ugly *.

Hence, even in the same species, there may sometimes be two races, the one masculine and the other feminine, which, by both subsisting

* Daily experience will contradict this assertion: it is not at all uncommon for handsome women to have plain children, and the contrary. *W.*

and perpetuating their distinctive characters, appear to constitute two different species; and this seems to be the case, when it is almost impossible to fix the limits between what naturalists term *species* and *variety*. Let us suppose, for example, that some sheep were always served with he-goats, and others with rams; after a certain number of generations, a race would be established among the species of sheep, which would partake greatly of the nature of the goat, and would afterwards perpetuate its own kind; for, though the first produce of the he-goat would be little removed from the mother's species, and would be a lamb, and not a kid; yet this lamb is already covered with hair, and possesses some other characters of the father. Let these several mongrels be afterwards served with a he-goat; the produce in this second generation will make a nearer approach to the species of the father, and still nearer in the third, &c. In this manner, the foreign characters will soon overbalance the natural ones; and this fictitious race might support itself, and form a variety in the species, the origin of which it would be difficult to trace. Now, what might arise from the influence of one species on another, may be produced with greater ease in the same species. If vigorous females be constantly served with feeble males, in process of time a feminine race will be established; and, if very strong males are appropriated to females of inferior strength and vigour, a masculine race will be the result, so different in appearance from the first, that we could not assign to them a

common origin, and, of course would regard them as two distinct species.

To these general reflections, we shall add some particular facts. We are assured by Linnæus *, that he saw in Holland two animals of the goat kind, of which the one had very short, thick horns, lying almost flat on the skull; the horns of the other were erect, and bended backward at the points, and its hair was short. These animals, though they seemed to be more remote in species than the chamois and common goat, failed not to produce together; which demon-

* Capra cornibus depressis, incurvis, minimis, cranio incumbentibus, gula barbata. Magnitudo hædi hirci: pili longi, penduli; cornua lunata, crassa, vix digitum longa, cranio adpressa ut fere cutem perforent: habitat in America. Linnæus, I suspect, has not been properly informed with regard to the country of this animal, and I believe it to be a native of Africa. My reasons are, 1. That no author mentions this species of goat, nor even the common goat, as being ever found in America; 2. That all travellers, on the contrary, agree in assuring us, that there are three kinds of goats in Africa, a large, a middle, and a small kind; 3. That we have seen an animal, which we received under the name of the *African buck*, and of which we have given a figure, that resembled so much Linnæus's description of the *capra cornibus depressis*, &c., that we considered it to be the very same animal. For these reasons, we are entitled to affirm, that this small goat is an original native of Africa, and not of America.

Capra cornibus erectis, apice recurvis. Magnitudo hædi hirci unius anni. Pili bræves, cervini. Cornua vix digitum longa, antrorsum recurvata apice: hæc cum præcedenti coibat, et pullum non diu superstitem in vivario Cliffortiano producebat. Facies utriusque adeo aliena, ut vix speciem eandem at diversissimam, argueret. — *Linn. Syst. Nat.* p. 96.

strates that these differences in the figure of the horns, and length of the hair, are not essential and specific characters; for, as the animals produced together, they must be regarded as belonging to the same species. From this example, it may be concluded, that the chamois and our goat, whose principal differences lie in the form of the horns and the length of the hair, are probably the same species.

In the Royal Cabinet, there is the skeleton of an animal, which was sent under the name of *capricorne.* In the form of the body and proportions of the bones, it has a perfect resemblance to the domestic he-goat; and the figure of the under jaw is the same with that of the wild goat. But it differs from both in the horns: those of the wild goat have prominent tubercles or knobs, and two longitudinal ridges, between which there is a well marked anterior face: those of the common he-goat have but one ridge, and no tubercles. The horns of the capricorne have but one ridge, and no anterior face: though they want tubercles, they have rugosities which are larger than those of the he-goat. These differences seem to indicate an intermediate race between the wild and the domestic goat. Besides, the horns of the capricorne are short and crooked at the point, like those of the chamois; and, at the same time, they are compressed, and have rings: hence they partake at once of the he-goat, the wild goat, and the chamois goat.

Mr. Brown*, in his History of Jamaica, informs us, that there are in that island, 1. the common domestic goat of Europe; 2. the chamois; 3. the wild goat. He assures us, that none of these animals are natives of America, but have been transported from Europe; that, like the sheep, they have degenerated and become smaller in this new country; that the wool of the sheep is changed into hair as coarse

* Capra I. cornibus carinatis arcuatis. — *Linn. Syst. Nat.* The nanny goat.

Capra II. cornibus erectis uncinatis, pedibus longioribus.

Capra cornibus erectis uncinatis. — *Linn. Syst. Nat.* The rupi goat. . . . .

Neither of these are natives of Jamaica; but the latter is often imported thither from the Main and Rubee island; and the other from many parts of Europe. The milk of these animals is very pleasant in all those warm countries; for it loses that rancid taste, which it naturally has in Europe. A kid is generally thought as good, if not better, than a lamb, and is frequently served up at the tables of all ranks.

Capra III. cornibus nodosis in dorsum reclinatis. — *Linn. Syst. Nat.* . . . . The bastard ibex.

This species seems to be a bastard sort of the ibex goat; it is the most common kind in Jamaica, and esteemed the best by most people. It was first introduced there by the Spaniards, and seems now naturalized in these parts.

Ovis I. cornibus compressis lunatis. — *Linn. Syst. Nat.* The sheep. These animals have doubtless been bred in Jamaica ever since the time of the Spaniards, and thrive well in every quarter of the island; but they are generally very small. A sheep carried from a cold climate to any of those sultry regions, soon alters its appearance; for, in a year or two, instead of wool, it acquires a coat of hair like a goat. — *The Civil and Natural History of Jamaica, by Patrick Brown, M. D.* chap. v. sect. 4.

as that of the goat; that the wild goat seems to be a bastard race, &c. Hence we are led to believe, that the small goat, with erect horns, and crooked at the points, which Linnæus saw in Holland, and was said to have come from America, is the chamois of Jamaica, that is, the European chamois degenerated and diminished by the climate of America; and that the wild goat of Jamaica, called the *bastard wild goat* by Mr. Brown, is our capricorne, which seems to be nothing else than the wild goat degenerated by the influence of climate.

M. Daubenton, after scrupulously examining the relations of the chamois to the he-goat and ram, says, in general, that it has a greater resemblance to the he-goat than to the ram. Next to the horns, the chief differences are found in the figure and size of the front, which is less elevated and shorter, and the form of the nose, which is more contracted in the chamois than in the he-goat; so that, in these two articles, the chamois resembles the ram more than the he-goat. But, by supposing, what is extremely probable, that the chamois is a constant variety of the species of the he-goat, as the bull-dog and greyhound are constant varieties in the dog kind, we will perceive that these differences in the size of the front and the position of the nose, are not nearly so great in the chamois, when compared with the he-goat, as in the bull-dog and greyhound, which, however, produce together, and certainly belong to the same species.

Besides, as the chamois resembles the he-goat in a greater number of characters than the ram, if he constituted a particular species, it must necessarily be an intermediate one between the he-goat and the ram. Now, we have seen, that the he-goat and ewe produce together: the chamois, therefore, which is an intermediate species between the two, and, at the same time, has a greater number of resemblances to the he-goat than to the ram, ought to produce with the she-goat, and, consequently, should be regarded as only a constant variety of this species.

Hence, as the chamois was transported into America, where it has become smaller, and produces with the small she-goat of Africa, it is more than probable that he would also produce with our she-goats. The chamois, therefore, is only a constant variety in the goat kind, like the bull-dog in the species of the dog. On the other hand, the wild goat is unquestionably the primitive goat in a state of nature, and is, with regard to the domestic goats, what the mouflon is to the sheep. The wild he-goat perfectly resembles the domestic he-goat in figure, structure, habits, and dispositions; and there are only two slight external differences between them. The horns of the wild he-goat are larger than those of the common he-goat. The former have two longitudinal ridges, and the latter but one. They have also large transverse protuberant rings, which mark the years of their growth; whilst those of the domestic he-

goat have only a kind of transverse striæ or furrows. The figure of their bodies is precisely the same. Their internal structure is likewise perfectly similar, with the exception of the spleen, which is oval in the wild he-goat, and approaches nearer to the spleen of the roebuck or stag, than to that of the he-goat or ram. This difference may proceed from the violent exercise of the animal. The wild he-goat runs as swiftly as the stag, and leaps more nimbly than the roebuck. His spleen, therefore, should resemble that of the swiftest running animals. Hence this slight difference depends more upon habit than nature; and it is probable, that, if our domestic he-goat should become wild, and were obliged to run and leap like the wild he-goat, his spleen would soon assume the figure most conformable to this exercise. With regard to the difference of his horns, though very conspicuous, they fail not to resemble those of the domestic he-goat more than those of any other animal. Thus the wild and common he-goat approach nearer each other, even in the form of their horns, than any other animal; and, as their resemblance is complete in every other article, we should conclude, that, notwithstanding this slight and solitary difference, they are both animals of the same species.

The wild, the chamois, and the domestic goat must, therefore, be considered as the same species, the males of which have undergone greater variations than the females: I find, at the same

time, in the domestic kind, secondary varieties, which are the less equivocal, because they belong equally to the males and females. We have seen that the goat of Angora *, though very different from ours in the hairs and horns, is nevertheless of the same species †. The same thing may be said of the Juda goat, which Linnæus has properly considered as a variety of the domestic species ‡ This goat, which is common in Guinea §, Angola, and other parts of Africa, may

* See vol. iv. p. 305.

† *Capra Angorensis.* C. pilis longissimis crispis toto corpore vestita. — *Linn. Syst. Nat. Gmel.* i. p. 194.

Capra, varietas angorensis. — *Erxleb.*

This variety, says Pennant, is confined to very narrow bounds; inhabiting only the tract that surrounds Angora and Beibazar (towns in Asiatic Turkey), for the distance of three or four days' journey. The most valuable part of the animal is its hair, which is soft as silk, of a glossy, silvery whiteness, and curled in locks of eight or nine inches in length. This hair is the basis of our fine camlets.

W.

‡ *Capra reversa.* C. cornibus erectis, apice recurvis. — *Linn. Syst. Nat. Gmel.* i. p. 195.

According to Sonnini, the herds of Upper Egypt are entirely formed of this variety of goat. It is much smaller than the Mambrina goat, the only one to be found in Lower Egypt. Their horns are delicate and prettily twisted; their hair long, and almost as soft as silk: in several other respects they resemble the Angora goat.

They bleat almost incessantly, making a noise like the cry of an infant. *W.*

§ In Guinea there are great numbers of goats similar to these in Europe, except that, like all the other cattle, they are very small. But they are fatter and plumper than wed-

be said to differ from ours only in being smaller, fatter, and more squat. Its flesh is excellent; and, in that country, it is preferred to mutton, as we prefer mutton to goat's flesh.

We here give a figure of a Juda buck, which appears to be different from that published in the original work. M. Bourgelat had it alive, and still keeps its skin in his anatomical cabinet. It was considerably larger than the one formerly engraved. It was two feet nine inches long, and one foot seven inches high, while the other was only twenty-four inches and a half long, and seventeen inches high. The head and whole body were covered with large white hairs. The points of the nostrils were black. The horns nearly touch each other at the base, and then recede. They are much longer than those of the former, which the present one resembles in the feet and hoofs. These differences are too slight to constitute two distinct species. They seem to be only varieties of the same species.

The Levant or Mambrina goat *, with long pendulous ears, is only a variety of the goat of

ders: it is for this reason that some people prefer the flesh of these small he-goats, which the natives castrate, to mutton. — *Voyage de Bosman*, p. 328.

* It is called the Mambrina goat, because it is found on Mount Mambrina, in Syria. Capra Indica. — *Gesner, Hist. Quad.* p. 267. Hircus cornibus minimis, erectis, parumper retrorsum incurvis, auriculis longissimis pendulis. Capra Syriaca. — *La chevre de Syrie; Brisson, Regn. Anim.* p. 72.

Angora, which has also pendulous ears, though they are not so long. These two goats were known to the ancients *; but they did not separate them from the common species. This variety of the Mambrina or the Syrian goat is more diffused than the goat of Angora; for we find goats with long ears in Egypt †, and in the East Indies ‡, as well as in Syria. They yield a great deal of fine milk §, which the natives of the East prefer to that of the cow or buffalo ‖.

* In Syria oves sunt cauda lata ad cubiti mensuram: capræ auriculis mensura palmari et dodrantali, ac nonnullæ demissis, ita ut spectent ad terram. In Cilicia capræ tondentur ut alibi ovis. — *Aristot. Hist. Anim.* lib. viii. c. 28.

† Ex capris complures sunt (in Ægypto) quæ ita aures oblongas habent, ut extremitate terram usque contingant. — *Prosp. Alpin. Hist. Ægypt.* lib. iv. p. 229.

‡ At Pondicherry, there are kids which differ much from ours. They have large pendulous ears; and their aspect is mean and silly. Their flesh, though bad, is sometimes eaten. — *Nouveau Voyage, par le Sieur Luiller*, p. 30.

§ Goats are remarkable for the length of their ears. The size of the animal is somewhat larger than ours; but their ears are often a foot long, and broad in proportion; they are chiefly kept for their milk, of which they yield no inconsiderable quantity; and it is sweet, and well tasted. — *Nat. Hist. of Aleppo, by Alexander Russel, M. D.*

‖ *Capra Mambrica.* C. cornibus reclinatis, auribus pendulis, gula barbata. — *Linn. Syst. Nat. Gmel.* i. p. 194.

"Their ears of a vast length, hanging down like those of hounds; are from one to two feet long: sometimes they are so troublesome, that the owners cut off one to enable the animal to feed with more ease." — *Penn. Synops. Quadr.* p. 63.

Sonnini denies this assertion, and says, that the ears neither touch the ground nor are cut off. *W.*

In Madagascar there is a goat considerably larger, with pendulous ears so long, that, when they fall down, they cover the eyes, which obliges the animal to move its head almost continually in throwing them back. Hence, when pursued, it always endeavours to ascend. This notice was communicated to us by M. Comerson; but it is too imperfect to enable us to determine whether this goat belongs to the Syrian race with pendulous ears, or to a different species.

We had the following note from M. le Vicomte de Querhoënt:

"The goats which were left on Ascension Island have multiplied greatly; but they are very meager, especially in the dry season. The whole island is beaten with their tracks. During the night, they retire into the excavations of the mountains. They are not so large as the common goat. They are so weak, that men sometimes seize them in the chase. Their hair is generally of a deep brown colour.

With regard to the small goat which Linnæus saw alive, and which produced with the American chamois, it must, as formerly remarked, have been originally transported from Africa; for it so strongly resembles the he-goat of Africa, that it is unquestionably the same species; or, at least, it has sprung from the same stock. In Africa it is small; and [illegible] would become still less in America; and we [illegible] from the testimony of travellers, that sheep, hogs, and goats, have frequently, and for several ages back, been transported from Africa, as well as Europe, into Ame-

rica, where they still subsist, without any other change than a diminution of size *.

After examining the different varieties of goats, of which the nomenclators have made nine or ten different species, I am convinced that they ought to be reduced to one: 1. The wild he-goat is the principal stock of the species. 2. The capricorne is the wild he-goat, degenerated by the influence of climate. 3. The domestic he-goat derives his origin from the wild he-goat. 4. The chamois is only a variety in the species of the she-goat, with whom, like the wild he-goat, he should be able to mix and produce. 5. The small goat, with erect horns, crooked at the points, mentioned by Linnæus, is the European chamois, diminished by the influence of the American climate. 6. The other small goat, with horns lying flat on the skull, and which produced with the American chamois, is the same with the African he-goat; the fertility of these two animals is a proof that our chamois and domestic goat would also produce together, and, of course, that they belong to the same species. 7. The dwarf goat, which is probably the female of the African buck, is only, as well as the male, a variety of the common kind. 8. The same thing

* This goat is specified by Linnæus under the following title:

Capra depressa. C. cornibus depressis incurvis minimis, cranio incumbentibus. — *Linn. Syst. Nat. Gmel.* i. p. 195.

W.

may be said of the buck and she-goat of Juda; for they are only varieties of our domestic goat. 9. The goat of Angora, as it produces with out goats *, belongs to the same species. 10. The Mambrina or Syrian goat, with very long pendulous ears, is a variety of the goat of Angora. Thus these ten animals are only different races of the same species, which have been produced by the influence of climate. *Capræ in multas similitudines transfigurantur*, says Pliny †. Indeed, from this enumeration, it is apparent, that the goats, though essentially similar among themselves, vary greatly in their external form; and, if we comprehend, like Pliny, under the generic name of *goats*, not only those we have mentioned, but likewise the roebuck, the antelopes, &c., this species would be the most extensive in Nature, and contain more races and varieties than that of the dog. But Pliny, when he joined the roebuck, antelopes, &c., to the species of the goat, betrayed his ignorance of the real distinction of species. These animals, though they resemble the goat in many respects, constitute two different species; and we shall perceive, from the following articles, how greatly the antelopes vary both in species and in races; and, after enumerating all the antelopes and all the goats, we shall still

* See vol. iv. article Goat.

† Capræ tamen in plurimas similitudines transfigurantur; sunt capreæ, sunt rupicapræ, sunt ibices.—Sunt et origes.—Sunt et Damæ et Pygargi et Strepsicerotes, multaque alia haud dissimilia.—Lib. viii. cap. 53.

find other animals which participate of both. In the whole history of quadrupeds, I have met with nothing so confused, so uncertain, and so obscure, as the accounts given us by naturalists and travellers concerning the goats, the antelopes, and the species which have a relation to them. I have exerted every effort to throw light upon this subject; and shall not regret my labour, if what I now write should contribute to remove error, and to extend the views of those who incline to study Nature. But to return to our subject.

The goats are subject to vertigos: this disease is likewise common to the wild and chamois goats *, as well as the inclination to climb upon rocks, and the habit of perpetually licking stones †, especially those which are impregnated with nitre or salt. In the Alps, we find rocks

* In the mountains of Switzerland, the chamois, or wild goats, are very frequent. . . . . The natives inform us, that these animals are subject to vertigos; and that, when attacked with this disease, they sometimes come down to the meadows, and mix with the horses and cows, when they are taken with ease.—*Extrait du Voyage de Jean-Jacques Scheuchzer: Nouvelles de la Republique des Lettres*, p. 182.

† Conveniunt sæpe circa petras quasdam arenosas, et arenam inde lingunt. . . . . Qui Alpes incolunt Helvetii hos locos sua lingua *Fultzen* tanquam salarios appellant.—*Gesn. Hist. Quadr.* p. 292. What is singular, in the Alps there are several rocks which have been hollowed by the constant licking of the chamois goats. This licking is not occasioned, as has been alleged, by salt contained in these stones, which is very rarely the case; for the rocks are porous and composed of grains of sand, which are easily detached; and they are swallowed by the animals with great avidity.—*Extrait de Scheuchzer, ibid.* p. 185.

hollowed with the tongues of the chamois. They are generally composed of tender and calcinable stones, in which there is always a certain quantity of nitre. These conformities in natural dispositions and manners appear to be infallible indications of identity of species. The Greeks, as formerly remarked, did not divide these three animals into three distinct kinds; and our hunters, who probably never consulted the Greeks, have also regarded them as the same species. Gaston Phæbus*, when treating of the wild goat, points him out under the name of the *wild buck*; and the chamois, which he calls *ysarus* and *sarris*, in his estimation, is only another wild buck. I acknowledge that all these authorities amount not to a complete proof: but, when joined to the facts and reasonings already employed, they form so strong a presumption, with regard to the unity of species in these three animals, as leaves no room for hesitation.

The wild and chamois goats, which I considered, the one as the male, and the other as the female stock of the goat kind, are only found, like the mouflon, which is the stock of the sheep, in the deserts and in the highest and most rugged mountains. The Alps, the Pyrennees, the Grecian mountains, and those in the islands of the Archipelago, are almost the only places where the wild and chamois goats are to be found. Though both avoid heat, and inhabit the regions of snow and frost; yet they equally avoid the excessive rigours of cold. In summer, they dwell

* La Venerie de Gaston Phæbus, p. 68.

on the northern sides of the mountains; in winter they frequent the southern sides, and descend from the summits into the plains. Neither of them can support themselves on smooth sheets of ice; but, when the ice is rendered rough by the snow, they run and bound with great firmness and agility. The chase of those animals *, especially that of the wild he-goat,

* There are two kinds of bucks; some are called *wild bucks*, and others *ysarus* or *sarris*. The wild bucks are as large as a stag; but, though they have as much flesh, they are neither so long, nor make such great bounds. The years of their age correspond with the number of rings which encircle their horns. . . . . When old, their horns, which have no branches, are as thick as a man's leg. They never cast their horns; but they continue to grow in length and thickness as long as the animal lives. They have a large beard, and their hair is brown like that of the wolf. A black bar runs along their back and down the buttocks. Their belly is yellow, and their legs black and yellow behind. Their feet, like those of the domestic goat, are cloven; and their tracks are large, and rounder than those of the stag. The female, like that of the hind, or common she-goat, produces but one at a time.

The bucks feed upon herbage like other cattle. . . . . . . Their dung resembles that of the domestic goat. They come in season about All Saints' Day, and their rutting season continues a month. When that season is over, they are much emaciated; and they descend from the rocks and mountains, where they had dwelt during the summer, to the plains, in quest of food. They remain at the foot of the mountains, till toward Easter, when they return to the most elevated places they can find, and each takes possession of his bush, like the stags. The females, at this period, separate from the males, and retire near the brooks, in order to fawn, where they remain during the summer. When the bucks are thus separated from the females, especially at the approach of the rutting season, they attack both man and beast.

is very laborious; for dogs are almost useless in this kind of hunting. It is also sometimes dangerous: when the animal finds himself hard pushed, he gives the hunter a violent blow with his head, and often throws him over a precipice *. Though not so strong as the wild bucks, the chamois goats are equally active †. They

They also fight among themselves, like the stags, but in a different manner; for their quarrels are more formidable. The buck strikes so furiously with his head, that he often breaks the legs of those whom he attacks; and, if he runs a man against a tree, or throws him down on the ground, death is infallibly the consequence. Such is the nature of the buck, that, though a strong man gives him a blow on the back with a bar of iron, the animal's spine does not break. In the season of love, his neck swells prodigiously: and, though he falls from a height of ten fathoms, he receives no injury.

The buck called *ysarus* is of the same figure with the preceding, and is not larger than the domestic he-goat. His nature is the same with that of the wild buck. . . . . Like the stag, both come in season about All Saints' Day, and they should be hunted till that period arrives. . . . . When they can find no other food in winter, they eat the leaves of the pine-tree, which are always green. Their skin, when properly dressed, is an excellent defence against the cold; for, when the hair is outmost, neither cold nor rain can penetrate it. Their flesh is not very wholesome; for it produces fevers. . . . . . The hunting of the buck is not very pleasant; for we can neither accompany the dogs on foot nor on horseback. —*Gaston Phœbus, Venerie de Dufoilloux*, p. 68.

* Ibex venatorem expectat, et solicite observat an inter ipsum et rupem minimum intersit spatium; nam si visu duntaxat intertueri (ut ita loquar) possit impetu facto se transfert et venatorem impulsum præcipitat.—*Stumpfius apud Gesn.* p. 305

† M. Perroud, undertaker of the crystal mines in the Alps, brought a live chamois to Versailles, and gave us the following excellent remarks on the nature and manners of this ani-

are more numerous, and go generally in flocks. In the Alps and Pyrennees, however, they are not

mal: "The chamois, though a wild animal, is very docile. He inhabits only the mountains and rocks. He is of the size of a domestic goat, which he greatly resembles. His vivacity is delightful, and his agility truly admirable. His hair is as short as that of a hind: in spring it is ash-coloured, in summer it is yellowish, in autumn yellowish brown mixed with black, and, in winter, brownish black. The chamois goats are numerous in the mountains of Upper Dauphiny, Piedmont, Savoy, Switzerland, and Germany. They are very social among themselves: we find them going in pairs, or in little flocks of from three to twenty; and sometimes we see from sixty to a hundred of them dispersed in different flocks along the declivity of the same mountain. The large males keep at a distance from the rest, except in the rutting season, when they join the females, and beat off all the young. At this period, their ardour is still stronger than that of the wild bucks. They bleat often, and run from one mountain to another. Their season of love is in the months of October and November, and they bring forth in March and April. A young female takes the male at the age of eighteen months. The females bring forth one, but rarely two, at a time. The young follow their mothers till October, if not dispersed by the hunters or the wolves. We are assured that they live between twenty and thirty years. Their flesh is very good. A fat chamois goat will yield from ten to twelve pounds of suet, which is harder and better than that of the goat. The blood of the chamois is extremely hot, and it is said to have qualities and virtues nearly equal to those of the wild goat, and may serve the same purposes; for the effects are the same, when taken in a double dose. It is good against pleurisies, and possesses the property of purifying the blood, and promoting perspiration. The hunters sometimes mix the blood of the wild and chamois goats: at other times, they sell the blood of the wild goat for that of the chamois. It is very difficult to distinguish them; which shows that the blood of the wild goat differs very little from that of the chamois. The voice of the chamois is a very low

now so frequent as formerly. The term *Chamoiseurs*, which was applied to all transporters of

and almost imperceptible kind of bleating, resembling that of a hoarse domestic goat. It is by this bleating that they collect together, particularly the mothers and their young. But, when alarmed, or when they perceive an enemy, or any thing the nature of which they cannot distinguish, they advertise one another by a kind of whistling noise, which I shall afterwards describe. The sight of the chamois is very penetrating, and his sense of smelling is acute. When he sees a man distinctly, he stops for some time, and flies off, when he makes a nearer approach. His sense of hearing is equally acute as that of smelling; for he hears the smallest noise. When the wind blows in the direction between him and a man, he will perceive the scent at the distance of more than half a league. Hence, when he smells or hears any thing which he cannot see, he whistles or blows with such force, that the rocks and forests re-echo the sound. If there are many of them near, they all take the alarm. This whistling is as long as the animal can blow, without taking breath. It is at first sharp, and turns flat towards the end. The chamois then stops for a moment, looks round on all sides, and begins whistling afresh, which he continues from time to time. His agitation is extreme. He strikes the earth with his feet. He leaps upon the highest stones he can find: he again looks round, leaps from one place to another, and, when he discovers any thing, he flies off. The whistling of the male is sharper than that of the female. This whistling is performed through the nostrils, and consists of a strong blowing, similar to the sound which a man may make by fixing his tongue to the palate, with his teeth nearly shut, his lips open, and somewhat extended, and blowing long and with great force. The chamois feeds on the finest herbs. He selects the most delicate parts of plants, as the flowers and the tenderest buds. He is very fond of some aromatic herbs, particularly of the carline thistle and genipay, which are the hottest plants that grow in the Alps. When he eats green herbs, he drinks very little. He is very fond of the leaves and tender buds of shrubs. He ru-

skins, seems to indicate, that the chamois skins were at that time the chief article of their com-

minates like the common goat. The food he uses seems to announce the heat of his constitution. This animal is admired for his large round eyes, whose size corresponds with the vivacity of his disposition. His head is adorned with two small horns, from half a foot to nine inches in length. Their colour is a fine black, and they are placed on the front nearly between his eyes; and, instead of being reflected backward, like those of other animals, they advance forward above the eyes, and bend backward at the points, which are extremely sharp. He adjusts his ears most beautifully to the points of his horns. Two tufts of black hair descend from the horns to the sides of his face. The rest of the head is of a yellowish white colour, which never changes. The horns of the chamois are used for the heads of canes. Those of the female are smaller and less crooked. The skin of the chamois, when dressed, is very strong, nervous, and supple, and makes excellent riding breeches, gloves, and vests. Garments of this kind last long, and are of great use to manufacturers. The chamois is a native of cold countries, and always prefers rugged rocks and lofty places. They frequent the woods; but it is only those in the higher regions of the mountains. These woods consist of pines, larches, and beeches. The chamois goats are so impatient of heat, that, in summer, they are only to be found under the shades of caverns in the rocks, among masses of congealed snow and ice, or in elevated forests on the northern declivities of the most scabrous mountains, where the rays of the sun seldom penetrate. They pasture in the mornings and evenings, and seldom during the day. They traverse the rocks and precipices with great facility, where the dogs dare not follow them. There is nothing more worthy of admiration than to see these animals climbing or descending inaccessible rocks. They neither mount nor descend perpendicularly, but in an oblique line. When descending, particularly, they throw themselves down across a rock, which is nearly perpendicular, and of twenty or thirty feet in height, without having a single prop to support their feet. In de-

merce; but the skins of goats, sheep, stags, roebucks, and the fallow deer, are their principal objects.

scending, they strike their feet three or four times against the rock, till they arrive at a proper resting-place below. The spring of their tendons is so great, that, when leaping about among the precipices, one would imagine they had wings instead of limbs. It has been alleged, that the chamois, in climbing and descending rocks, supports himself by his horns. I have seen and killed many of these animals; but I never saw them use their horns for this purpose; neither did I ever hear the fact supported by any hunter. It is by the strength and agility of his limbs that the chamois is enabled to climb and descend rocks. His legs are very free and tall; those behind are somewhat longer, and always crooked, which favours their springing to a great distance; and, when they throw themselves from a height, the hind-legs receive the shock, and perform the office of two springs in breaking the fall. It is said, that, when there are numbers of chamois goats together, one is deputed to stand sentinel, for the protection of the rest. I have seen many flocks of them, but never observed this part of their economy. It is true, that, when there are many of them, some always watch while others eat; but I remarked nothing more singular here than what happens in a flock of sheep: for the first who perceives any thing alarming, advertises the rest, and, in an instant, the same terror is communicated to the whole. In great snows, and during the rigour of winter, the chamois goats inhabit the lower forests, and live upon pine leaves, the buds of trees, bushes, and such green or dry herbs as they can find by scratching off the snow with their feet. The forests that delight them most, are those which are full of rocks and precipices. The hunting of the chamois is very difficult and laborious. The mode most in use is to kill them by surprise. The hunters conceal themselves behind rocks or large stones, taking care that the wind blows opposite to them, and, when a favourable opportunity occurs, shoot them with musket balls. They are likewise hunted in the same manner as stags and other animals,

With regard to the specific virtue attributed to the blood of the wild goat, against certain diseases, and particularly the pleurisy, a virtue which is thought to be peculiar to this animal, and which of course, would lead us to think it to be of a peculiar nature; it has been discovered, that the blood of the chamois *, and likewise that of the domestic he-goat †, have the same virtues, when the animals are nourished with the same aromatic herbs; so that even this property seems to unite these three animals in the same species ‡.

by posting some of the hunters in narrow passes, while others beat about to raise the game. Men are preferable for this purpose to dogs; for dogs too quickly disperse the animals, who fly off suddenly to the distance of four or five leagues." See also on this subject, *La troisieme Descript. du Voyage des Alpes de Scheuchzer*, p. 11.

* See p. 90.

† See l'Hist. des Animaux, par Mess. Arnault de Nobleville et Salerne, tom. iv. p. 243.

‡ Notwithstanding the many points of resemblance which the count de Buffon has noticed between the wild goat and the chamois, they are not only distinct species, but are placed by Linnæus in different genera, on account of the beard being wanting in the last mentioned animal. The flocks of the wild goat and the chamois, though inhabiting the same mountainous regions, always continue distinct; and, although they have the same natural habits, have never been known to copulate together. The two animals are equally wild, and are alike the objects of the chase; but the chamois seems to be preferred by the hunters, who will contend with every difficulty, and brave every danger to obtain it. In the note which precedes this (containing many excellent remarks on the nature and manners of the chamois), we find but a slight notice on the mode of hunting it; I shall therefore add what

Saussure has said upon the subject, that the reader may judge of the difficulties attending the pursuit of wild animals in mountainous regions.

The hunter generally goes out in the night, that he may arrive before day-break at the highest pastures frequented by the chamois. As soon as he can discover the places where he hopes to find them, he reconnoitres with a spy-glass. If he sees none, he advances; but if he is successful, he attempts to get above them, and creeps along some ravine, or runs behind some eminence or rock. When he is near enough to see their horns, he can calculate their distance; he rests his fusil on a rock, takes his aim with great coolness, and rarely misses. He uses a rifle gun, often with a double barrel. If he has killed the chamois, he runs to his prey and cuts off the hoofs; then he considers the road by which he must regain his village: if the way is difficult, he flays the chamois, and only takes the skin; but if the road is practicable, he throws his prize upon his shoulders, and carries it with him; frequently across precipices, and to a considerable distance. The flesh, which is very good, serves to support his family, and the skin is dried for sale.

But if, as it frequently happens, the vigilant animal perceives the hunter, it flies like lightning among the glaciers, on the snows, and to the top of the sharpest rocks. It is particularly difficult to approach them when many are together. Then one or two, while the rest feed, keep a look out on the point of some rock, which commands all the avenues to their pasture; as soon as this sentinel perceives any thing to be afraid of, he makes a whistling noise, upon which all the other chamois run toward him, that they may judge for themselves of their danger; and if they perceive a wild beast, or a hunter, an experienced one puts himself at their head, and they immediately fly to the most inaccessible places.

The fatigue of the hunter now commences; for, borne along by his passion, he knows no danger; he passes on the snows without thinking of the gulfs they may conceal; he enters upon the most perilous paths; ascends, and leaps from rock to rock, without considering how he shall be able to return. Night often overtakes him in the midst of

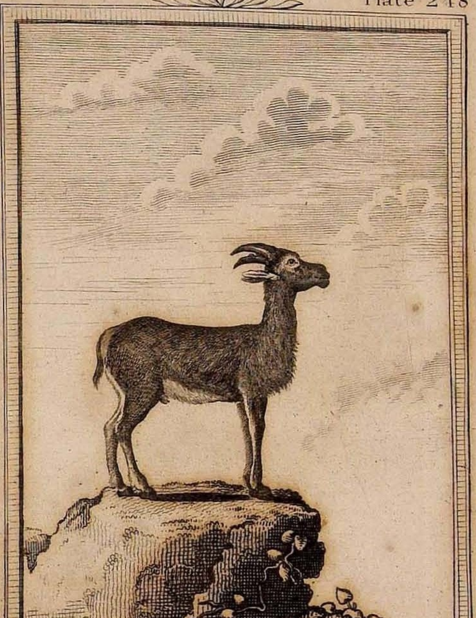
his pursuit; but this does not make him give it up; he flatters himself that the same cause which stops him, arrests also the chamois, and that he shall join them on the morrow. He passes the night, not at the foot of a tree like the hunter of the plain, nor on a grass plat in a grotto, but at the foot of a rock, often on a heap of ruins, without the slightest shelter. There, alone, without fire or light, he takes from his bag a morsel of cheese, and a piece of oat bread, which constitutes his common food; bread sometimes so dry, that he is obliged to break it between two stones, or with the hatchet which he carries with him to cut his footsteps in the ice: he concludes his frugal and melancholy meal, puts a stone under his head, and dreams of the route which the chamois may have taken. But soon awakened by the freshness of morning, he rises benumbed with cold, contemplates the precipices which he must leap to get at the chamois, drinks a little brandy, of which he always carries a small store, flings his bag upon his shoulder, and sets off to encounter new dangers. The hunters sometimes remain for several days together in these solitudes, and during this time, their families, particularly their unhappy wives, suffer the most horrible anxiety: they dare not even go to sleep, from the fear of seeing them appear in their dreams, for it is a received opinion in the country, that when a man loses his life, either in the ice, or on some unknown rock, he returns at night, to tell the person who is most dear to him, where to find his body, and to beseech her to bury him.

After this fearful picture of the life of the chamois hunters, can we comprehend why the passion for the chase becomes absolutely insurmountable? I knew a young man, of the parish of Sixt, says Saussure, well made, of a fine figure, and about to marry a charming woman: he spoke to me as follows. "My grandfather and my father died in the chase: I am so persuaded that I shall perish, that this bag, which you see, sir, and which I carry with me, I call my winding-sheet, because I am sure that I shall have no other; and yet, if you would offer to make my fortune, on condition that I gave up hunting the chamois, I would not do it." I made several tours on the Alps

with this man; he was very dexterous, and astonishingly strong; but his temerity exceeded his strength, and I found that, two years after, he slipt from the edge of a precipice, where he met the death he had so well predicted. — *Voyages dans les Alpes, par De Saussure*, tom. ii. p. 14[illegible].

W.

Plate 248



A Bell Sculp.t

WILD-GOAT.

Plate 249

A Bell Sculp.t

CHAMOIS GOAT.

Plate 250

A Bell Sculp.

AFRICAN HE-GOAT.

Plate 251

A. Bell Sculp.t

DWARF GOAT.

Plate 254

A Bell Sculpt.

BUCK of JUDA.

A Bell Sculp^t

SHE-GOAT of JUDA.

BUCK of JUDA.

THE SAIGA, OR SCYTHIAN ANTELOPE*.

IN Hungary, Poland, Tartary, and the southern parts of Siberia, there is a species of goat, called *Seigah* or *Saiga* by the Russians, which,

* CHARACTER SPECIFICUS.

ANTILOPE SAIGA. A. cornibus distantibus lyratis pallido-diaphanis, naso cartilagineo ventricoso.—*Linn. Syst. Nat. Gmel.* i. p. 185.—*Pallas, Miscell.* p. 6.

Antilope (Scythica), cornibus rectiusculis diaphanis, corpore albido.—*Erxleb. Mamm.* p. 289.—*Pallas, Spicil.* i. p. 9.

CAPRA TARTARICA. C. cornibus teretibus rectiusculis perfecte annulatis apice diaphanis, gula imberbi.—*Syst. Nat. Ed.* xii. p. 97.

COLUS.—*Gesn. Quadr.* p. 893.—*Jonst. Quadr.* pl. 27.

SUHAK.—*Aldrov. Bisulc.* p. 763.

IBEX IMBERBIS.—*Gmel. Nov. Comm. Petrop.* v. p. 345; vii. summ. p. 39, pl. 19, fig. maris et feminæ.

LE SAIGA.—*Buff. Hist. Nat. par Sonn.* xxx. p. 249, pl. 12, la corne.

SCYTHIAN ANTILOPE.—*Penn. Hist. Quadr.* i. p. 98.

SAIGA.—*Shaw's Gen. Zool.* ii. p. 339.

HABITAT

in vastis desertis Tanain inter et Borysthenem usque ad Astracan; etiam in Poloniæ finitimis visa. Gregaria.

W.

in the figure of the body and the hair, resembles the domestic goat. But the form of its horns and the want of a beard, make it approach nearer to the antelopes; and, indeed, it seems to constitute the shade between these two kinds of animals; for the horns of the saigæ are perfectly similar in figure, transverse rings, longitudinal furrows, &c., to those of the antelope, and they differ in colour only. The horns of all the antelopes are black and opaque; but those of the saiga are whitish and transparent. This animal

The Scythian antelope has horns a foot long, bending a little in the middle, the points inclining inward, and the ends smooth: the other part is surrounded with very prominent annuli. They are of a pale yellow colour, and the greatest part semipellucid. The length of the animal is four feet nine inches and a quarter; the height before, two feet six inches and a half, and behind, two feet seven inches and a half. The tail is three inches long. The head is like that of a sheep; the nose is very large, arched, and marked the whole length with a small line, caused by the elevation of the *septum narium*. The nostrils are tubular and large. The upper lip hangs over the under. The nose is formed of a muscular substance mixed with fat. The cutting teeth are so loose in their sockets, as to move with the least touch. The male is covered with rough hair, like the he-goat, and has a very strong smell: the female is smoother. The hair on the bottom of the sides and the throat is long, and resembles wool; that on the sides of the head and neck is hoary. The back and sides are of a dirty white colour. The breast, belly, and inside of the thighs, are of a shining white. The females are hornless and timid: if attacked by wolves or dogs, the males place the females in the centre, and defend them stoutly. They bleat like sheep. Their common pace is a trot; when they go faster, it is by leaps, and they are swifter than roebucks. When they feed, they lift up the upper mandible, and go backward.—*Penn. Synops. Quadr.* p. 35.

is mentioned by Gesner under the name of *colus* *, and by Gmelin under that of *saiga* †.

* Apud Scytas et Sarmatas quadrupes fera est quam *Colon* (Κόλος) appellant, magnitudine inter cervum et arietem, albicante corpore; eximiæ supra hos levitatis ad cursum. — *Strabo*, lib. vii. . . . . Sulac (a quo litteris transpositis nomen *Colus* factum videtur) apud Moschovios vulgo nominatur animal simile ovi sylvestri candidæ, sine lana: capitur ad pulsum tympanorum dum saltando delassatur. . . . . Apud Tartaros (inquit Matthias a Michow) reperitur *Snack*, animal magnitudine ovis, duabus parvis cornibus præditum, cursu velocissimum, carnes ejus suavissime. . . . In desertis campis circa Borysthenem (iniquit Sigismundus, Liber Baro in Herberstain in commentariis rerum Moscoviticarum) Tanaim et Rha est ovis sylvestris quam Poloni *Solbac*, Mosci *Seigak*, appellant, magnitudine capreoli, brevioribus tamen pedibus; cornibus in altum porrectis, quibusdam circulis notatis, ex quibus Mosci manubria cultellorum transparentia faciunt, velocissimi cursus et altissimorum saltuum. — *Gesn. Hist. Quadr.* p. 361 et 362, ubi vide figuras.

† In the environs of Sempalat, there are a number of *saigi* or *saiga*. This animal has a great resemblance to the roebuck, except that its horns are straight. It is known in no other part of Siberia; for what is called saiga in the province of Irkutzk is the musk. . . . The taste of its flesh, it is said, resembles that of the stag. *Voyage de Gmelin à Kamtschatka*, tom. i. p. 179. *Note*, M. Gmelin has since published a more comprehensive description of the saiga, in the first volume of the New Memoirs of the Academy of Petersburg, under the name of *ibex imberbis*; but he has given no figure of it. M. Gmelin remarks, that this animal has the head of a ram, with a higher and more prominent nose, and the body of a stag, but smaller; for it never reaches the size of a roebuck. The horns are yellowish and transparent, a foot in length, have rings or circles toward the base, and are situated above the eyes. The ears are erect, pretty large, and terminate in a point. In the under jaw, there are four cutting, four canine, and five grinding teeth, each of the last having two roots. In

The horns in the Royal Cabinet were sent under the denomination of *horns of the Hungarian buck*. They are so transparent, that they are used for the same purposes as shells. In natural disposition, the saiga has a greater resemblance to the antelopes than to the wild and chamois goats; for he does not frequent the mountains, but, like the antelopes, lives on the hills and plains. Like them, he is extremely swift, and his motion consists of bounds or leaps. His flesh is also better than that of either the wild or domestic goat.

Pallas thinks that the saiga which is met with in Hungary, Transylvania, Walachia, and in

the upper jaw there are an equal number of cutting and canine teeth, but only four grinders, each of which has three roots. The neck is pretty long. The hind are longer than the fore-legs. The foot is cloven. The female has four paps. The tail is thin, and about three inches long. The hair, like that of the stag, is of a yellowish brown colour on the body, and white under the belly. The female is smaller than the male, and has no horns. . . . . Worms breed under their skin. . . . . These animals copulate in autumn, and bring forth one or two young in the spring. They live upon herbage, and are very fat when the rutting season commences. In summer, they inhabit the plains along the banks of the Irtis. In winter, they go to the higher grounds; and they are found not only about the Irtis, but in all the countries watered by the Boristhenes, the Don, and the Wolga. — *Vide Nov. Com. Acad. Petrop.* tom. v. p. 345. The secretary of the Petersburg Academy adds, to what M. Gmelin has remarked, that the saiga goes backward when he feeds. . . . . That their horns are purchased by the Chinese to make lanthorns. . . . . That they are only found under the 54th degree of latitude; and that, in the East, there are none beyond the river Oby. — *Ibid.* p. 35.

Greece, may also be found in the isle of Candia: and he says that we ought to rank it with the *strepsicoros* of Belon. I am not of the same opinion, and have referred the strepsicoros of Belon to the genus of Sheep, and not to that of Antelope.

Saigis, saiga, says Gmelin, is an animal very like the roebuck, except in the horns, which, instead of being branched and shed annually, are permanent and straight. In Siberia, this animal is confined to particular districts; for that which is called saiga, in the province of Irkutzk, is the musk. This kind of wild goat (the saiga) is common enough in certain countries: although the flesh is eaten, our companions would not taste it, probably because we were not accustomed to the food, and besides, it is disgusting to see worms nestling between the true skin and the epidermis, even in the living animal. The worms are in great abundance, large and white, about three quarters of an inch long, and pointed at both ends: the same thing occurs to elks, rein-deer, and does. The worms of these goats appear to be the same as those of other animals, except in size. However this may be, the sight of the worms was sufficient to prevent us from tasting the meat, which we were also told was exactly like that of the stag*. I observed, that it is only after the rutting season, that the stags, the elks, and probably the saigas, have worms

* Gmelin's Travels in Siberia.

under their skin: see what I have said on the production of worms under the article Stag.

Mr. Forster writes me, "that the saiga is found from Moldavia and Bessarabia, to the river Irtisch, in Siberia. It frequents dry deserts full of wormwood, which is its principal food: it runs very quick, and has a fine scent, but its sight is not good, owing to four little spongy bodies, which serve to defend it from too great a glare of light, in a country where the soil is dry and white in summer, and covered with snow in winter. It has a large nose, and so fine a scent, that it can smell a man at more than a league, when the wind is fair, and we cannot even come near it, unless the wind blows from the opposite side. It is observed that the saiga appears to combine every requisite for running well: it respires more easily than any other animal, its lungs being very large; the trachea arteria is very wide, and the nostrils greatly extended, so that the upper lip is longer than the lower, appearing pendent; and it is probably to this shape of the lips, that we may attribute the retrograde manner in which this animal moves when feeding. These animals generally go in flocks, sometimes, we are assured, to the number of ten thousand; however, modern travellers have not mentioned these large bodies: it is more certain that the males unite together, to defend their young, and the females, against the attacks of wolves and foxes, for they form a circle round these ferocious ani-

mals, and fight them courageously. The females bring forth in spring, and have one kid, rarely two, at a time. The flesh is eaten in winter as game, but rejected in summer, on account of the worms which engender beneath the skin. Their rutting season is in autumn, and then they smell vary strongly of musk. The horns of the saiga are transparent, and esteemed for different purposes: the Chinese, especially, purchase them at a dear rate. Saigas are sometimes found with three horns, and they have also been seen with only one: this is confirmed by Pallas, and appears to be the same animal of which Rzaczinsky speaks, when he says, *aries campestris* (*Baran poluy*) *unius cornu instructus spectatur in desertis locis ultra Braclaviam Oczokoviam usque protęnsis.*

Saiga is a Tartar word, signifying wild goat; but they commonly call it *matgatch*, and the female *saiga* *.

* I have not translated Buffon's specific description of the animal, as it would be merely to repeat the words of Pennant, given in the note at the beginning of this article.

In addition to what Buffon has said, I shall add a few observations on the manners of the saiga, from Pennant's History of Quadrupeds.

"They very seldom feed alone; the males feeding promiscuously with the females and their young. They rarely lie down all at the same time: but by a providential instinct some are always keeping watch: and when they are tired, they seemingly give notice to those which have taken their rest, who rise instantly, and, as it were, relieve the sentinels of the preceding hours. They thus often preserve themselves

from the attack of wolves, and from the surprise of huntsmen.

"They are excessively swift, and will outrun the swiftest horse or greyhound: yet, partly through fear, for they are the most timid of animals, and partly by the shortness of their breath, they are very soon taken. If they are but bit by a dog, they will instantly fall down, nor will they even offer to rise. In running, they seem to incline to one side, and their course is so rapid, that their feet seem scarcely to touch the ground. In a wild state, they seem to have no voice; when brought up tame, the young emit a short sort of bleating, like sheep." *W.*

THE ANTELOPES, OR GAZELLES*.

OF the animals called *antelopes*, we know thirteen species, or at least thirteen distinct va-

* CHARACTER GENERICUS.

Cornua concava, sursum versa, teretia, annulata vel spiralia, persistentia.

Dentes primores superiores nulli, inferiores octo.

Laniarii nulli.

Pedes ungulati.

CHARACTER SPECIFICUS.

ANTILOPE DORCAS. A cornibus lyratis, corpore supra fulvo, subtris albo, fascia laterali fusca. — *Linn. Syst. Nat. Gmel.* i. p. 187. — *Schreb.* v. pl. 299.

Capra (Dorcas) cornibus teretibus perfecte annulatis, recurvatis contortis. — *Syst. Nat.* xii. 1. p. 96.

Hircus (Gazella Africana) cornibus teretibus arcuatis, ab imo ad summum fere annulatis, apice tantummodo lævi. — *Briss Regn. Anim.* p. 69.

GAZELLA AFRICANA. — *Ray's Quadr.* p. 80.

DORCAS ANTIQUORUM. — *Shaw, It.* p. 152.

LE GAZELLE — *Buff. Hist. Nat. par Sonn.* xxx. p. 260, pl. 14.

BARBARY ANTELOPE. — *Penn. Hist. Quadr.* i. p. 92. — *Shaw's Gen. Zool.* ii. p. 350.

rieties. In this uncertainty with regard to species and variety, we thought it best to treat of the whole under one article, assigning to each, however, a proper name. The first of these animals is the common *gazelle*, or Barbary antelope *, which is found in Syria, Mesopotamia, and other provinces of the Levant, as well as in Barbary, and in all the northern parts of Africa. The horns of this antelope are about a foot in length. They have entire rings at their base, and then half rings till within a small distance from the extremities, which are smooth and pointed. They are not only surrounded with rings, but furrowed longitudinally. The rings mark the years of growth, and they are commonly from twelve to thirteen in number. The antelopes in general, and this species in particular, have a great resemblance to the roebuck in figure, natural functions, nimbleness of movement, vi-

HABITAT

in Africa, etiam boreali, Arabia, Syria.

W.

In Arabic, *Gazal*, a generic name applied to several species of animals.

* The horns of the Barbary antelope are twelve inches long, round, inclining first backward, bending in the middle, and then reverting forward at their ends, and annulated with about thirteen rings on their lower part. The upper side of the body is of a reddish brown colour; the lower part and buttocks are white. Along the sides, the two colours are separated from each other by a strong dusky line. On each knee there is a tuft of hair.—*Pennant's Synops. Quadr.* p. 33.

A. Bell Sculp.t

GAZELLE.

vacity, largeness of the eyes, &c. And, as the roebuck exists not in the countries inhabited by the antelope, we would at first be led to conclude, that it is only a degenerated roebuck, or that the roebuck is an antelope whose nature has been changed by the effects of climate and food. But the antelopes differ from the roebuck in the substance of their horns. Those of the roebuck are a kind of solid *wood*, which falls off and is renewed annually, like that of the stag. The horns of the antelopes, on the contrary, are hollow and permanent, like those of the goat. Besides, the roebuck has no gall-bladder. The antelopes, as well as the roebucks, have hollows before the eyes. They resemble each other still more in the quality of the hair, in the whiteness of the buttocks, and in the tufts on their legs; but, in the roebuck, these tufts are on the hind-legs, and on the fore-legs of the antelopes. Hence the antelopes seem to be intermediate animals between the roebuck and goat. But when it is considered that the roebuck exists equally in both continents, and that the goats, as well as the antelopes, are peculiar to the Old World, we are led to think, that the goats and antelopes are more allied to each other than they are to the roebuck. Besides, the only characters peculiar to the antelopes are the transverse rings and longitudinal furrows on the horns; the tufts of hair on the fore-legs; a thick and well defined band of black, brown, or reddish hairs below the flanks; and, lastly, three stripes of whitish hairs, which

extend longitudinally upon the internal surface of the ears *.

The second antelope is found in Senegal, where, according to Mr. Adanson, it is called *kevel* †. It is less than the common kind, and is nearly of the size of our small roebucks. Its

* Algazel ex Africa, animal exoticum . . . . ex Africa Neapolium missum; magnitudine Capreæ, *Capreoli* dicti, cui toto habitu prima facie simile, nisi quod cornibus nulli magis quam hirco similioribus sit præditum. . . . Pilo est brevi, levi, flavicante, at in ventre et lateribus candicante, sicut in internis femorum et brachiorum, illoque capreolo molliori. Altitudo illius in posterioribus, quæ sublimiora sunt anterioribus tibiis, tres spithamas æquat. Corpus obesius, et collum crassius habet; cruribus et tibiis admodum gracile: ungulis bisulcis admodum dissectis, illisque tenuibus, et hircinis oblongioribus, et acutioribus similitudine alces, et nigricantibus. Caudam habet dodrantem fere pilosam, hircinam, et a medio usque ad extremum nigrescentem. . . . Hilaris aspectu facies; oculi magni, nigri, lucidi, læti; aures longæ, magnæ, patulæ, in prospectu elatæ, illæque intus canaliculatæ quinquefido strigium ordine nigricante, extumentibus circa illas striis pilosis candicantibus, et linea tenui circumducta. . . . Cornua pedem Romanum longa, retrorsum inclinata, hircina, ex nigro castaneo colore cochleatim striata, et interno situ ad invicem sinuata, et post dilatationem reflexa, atque deinde in extremo parum acie resupinata. . . . Nasus colore magis rufo, sicuti ex oculis parallelo ordine linea nigricans dependet ad os usque, reliquis candicantibus. Nares et labia, os et lingua nigrescunt, quod satis dum ruminabat observavimus; dentibus, ovium modo, exiguis et vix conspicuis; vocem edit non absimilem suillæ.—*Fab. Columnæ*, Annot. et Addit. in rerum Med. Nov. Hisp. Nardi. Ant. Recchi.—*Hernand. Hist. Mex.* p. 893 et 894.

† The horns of the kevel, or flat-horned antelope, are shaped like those of the last, but flatted on their sides. The

Plate 256

A. Bell Sculp.t

KEVEL.

eyes are also larger than those of the gazelle, and its horns, instead of being round, are flattened on the sides. This compression of the horns proceeds not from a difference of sex; for, in both males and females, the horns of the one species are round, and of the other flat. * In every other article, the resemblance is complete. The kevel, like the gazelle, has short yellow hair, a white belly and thighs, a black tail, a brown band under the flanks, three white stripes on the ears, black horns surrounded with rings, longitudinal furrows between the rings, &c. The number of these rings, however, is greater in the kevel than in the gazelle; for the latter has generally twelve or thirteen, and the former at least fourteen, and often eighteen.

The third antelope we shall denominate *corine* *, from the name *korin*, which it bears, according to M. Adanson, in Senegal. It has a great resemblance to the gazelle and kevel. But it is still smaller than the kevel, and its horns are

rings are more numerous, being from fourteen to eighteen. It is of the size of the roebuck; and in colours and marks resembles the preceding species.—*Penn. Synops. Quadr.* p. 34.

Antelope kevella. — *Pallas, Miscel.* vii. Spicil. 12.

* The corine, or spotted antelope, has very slender horns, six inches long, and surrounded with circular *rugæ*. It is less than a roebuck. On each side of the face there is a white line. The neck, body, and flanks, are tawny; the belly and inside of the thighs white, which is separated from the sides by a dark line. On the knees there is a tuft of hair. Some are irregularly spotted with white. Perhaps these are the spotted goats of Kolben, tom. ii. p. 115. — *Penn. Synops. Quadr.* p. 37.

thinner, shorter, and smoother, the rings which encircle them being hardly perceptible. M. Adanson, who communicated to me his description of this animal, says, that it appeared to partake somewhat of the chamois goat, but that it was much smaller, being only two feet and a half long, and less than two feet high; that his ears are four inches and a half in length, the tail three inches, the horns six inches long, and only half an inch thick; that they are two inches asunder at the base, and from five to six at their extremities; that, instead of rings, they have circular *rugæ*, very near each other in the inferior part, and more distant in the superior; that these *rugæ*, which hold the place of rings, are about sixteen in number; that the hair of this animal, which is short, shining, and close set, is yellow on the back and flanks, white on the belly, and the inside of the thighs; that the tail is black; and that, in the same species, some individuals have white spots scattered over their bodies without any order.

These differences between the gazelle, the kevel, and the korine, though very conspicuous, seem to be neither essential, nor sufficient to make these animals three distinct species. In every other respect, they resemble each other so strongly, that they appear to be of the same species, varied a little by the influence of climate and food; for the kevel and gazelle differ less from one another than from the corine, whose horns resemble not those of the other two. But all the three have the same natural habits; they

A Bell Sculp.t

CORINE.

go in troops, associate together, and feed in the same manner; their dispositions are gentle; they are easily accustomed to a domestic state; and their flesh makes excellent eating. We may, therefore, conclude, that the gazelle and kevel certainly belong to the same species, and that it is doubtful whether the corine be a variety only of the same, or really constitutes a distinct species.

In the Royal Cabinet, there are spoils either entire or partial, of these three antelopes. We have likewise a horn which greatly resembles those of the gazelle and kevel, but it is much larger. This horn is also engraven by Aldrovandus *. Its thickness and length seem to indicate an animal of greater magnitude than the common antelope; and I imagine it belongs to an antelope called *tzeiran* by the Turks, and *ahu* by the Persians. This animal, says Olearius †, has some resemblance to the fallow deer, except that it is reddish instead of yellow; that its horns have no antlers, and lie on the back, &c. According to Gmelin ‡, who mentions

* Lib. i. de bisulcis, cap. 21.

† We saw daily great numbers of a species of stag, called *tzeiran* by the Turks, and *ahu* by the Persians. They had some resemblance to our fallow deer; but they were rather reddish than yellow, and their horns want antlers, and lie on the back. They are exceedingly swift, and are only found, according to our information, in the province of Mokau, and in the neighbourhood of Scamachia, Karraback, and Merragé.—*Relation d'Olearius* tom. i. p. 413.

‡ I was shown a kind of deer, called *dsheren* in the language of the country. It resembles the roebuck, except that

this animal under the name of *dsheren*, it resembles the roebuck, except in its horns, which, like those of the wild he-goat, are hollow, and

it has the horns of a wild he-goat, which never fall off. What is singular in this animal is, that, in proportion as his horns grow, the size of the *larynx*, or *pomum Adami*, augments; so that, when old, he has a considerable swelling on his throat. Dr. Messerschmid asserts that this roebuck has an absolute aversion to water. But the inhabitants of Tongus assured me, that, when hunted, he often takes to the water, in order to make his escape; and brigadier Bucholz, at Selenginsck, told me, that he had tamed one completely; that it followed his servant when swimming; and that it often went to an island in the river Selinga, which it never would have done, if it had a natural aversion to water. These roebucks are as swift as the saigas on the borders of the Irtis.—*Voyage de M. Gmelin en Siberie*, tom. ii. p. 103. M. Gmelin has since given a more complete description of this animal, in the New Petersburg Memoirs, under the appellation of *Caprea Camprestris gutturosa*, of which the following is an abridgment: This animal resembles the roebuck in figure, size, colour, and manner of going. . . . . It has no cutting teeth in the upper jaw. The male differs from the female by having horns and a protuberance on the throat. The horns are somewhat compressed at the base. They have rings for a great part of their length; they are smooth at the points; and they are blackish, but perfectly black at the extremities. They are permanent, and shed not, like those of the roebuck. . . . . Upon the throat of the male, there is a large protuberance of five inches in length, and three in breadth: it is smaller when the animals are young, and it is not perceptible till they are near a year old. Its growth keeps pace with that of the horns. . . . This protuberance is occasioned by the structure of the larynx and the orifice of the trachea, which are very large. . . . . . The female is perfectly similar to the female roe. . . . . This animal differs from the *ibex imberbis*, or *saiga*. The nose of the saiga is large and split like that of the ram; but the nose of this animal is entire and pointed, like that of the

never fall off. This author adds, that, in proportion as the horns grow, the cartilage of the larynx enlarges, and forms a considerable prominence when the animal is old. According to Koempfer *, the figure of the *ahu* differs not from that of the stag: but he approaches to the goats by his horns, which are simple, black, and encircled with rings, for more than one half of their length, &c.

Some other travellers † have likewise mentioned this species of antelope under the name of *geiran*, or *jairan*, which, as well as *dsheren*, may be easily referred to the original name *tzeiran*. This antelope is common in South

roebuck. . . . . The Monguls, and even the Russians, call the male *dseren*, and the female *ona*, &c. — *Nov. Comment. Acad. Petropol.* tom. v. p. 347. The secretary to the Petersburg Academy adds, that, in the manuscripts of Messerschmid, this animal is mentioned under the names of *ohna*, *dseren*, and *scharchoeschi*.—*Ibid.* p. 36.

* Ipsum animal (*ahu*) a cervis nihil habet dissimile præter barbam, et cornua non ramosa quibus se caprino generi adsociat; cornua sunt simplicia, atra, rotundis annulis ultra mediam usque longitudinem distincta, levia et quasi ad modulum tornata; in mari quidem surrecta, pedalis longitudinis, in medio levi arcu disjuncta, fastigiis rectis mutuo utcunque imminentibus; in fœmina vero præparva vel nulla. — *Koempfer, Amœnitates*, p. 404 *Note*, The descriptions here given by Koempfer, of the *pasen* and *ahu*, correspond not with the figures.

† Upon the route from Tauris to Kom, we saw a kind of wild animals, whose flesh was good, and the Persians called them *geirans* or *garzelles*. — *Voyage de Gemelli Careri*, tom. ii. p. 63. In the deserts of Mesopotamia, there are vast numbers of antelopes, which the Turks call *jairain*.—*Voyage de la Boullaye-le-Gouz*, p. 247.

Tartary, in Persia, and seems also to be found in the East Indies *.

To these four species or races of antelopes, we may add other two, which have a great resemblance to them. The first is called *koba* † in Senegal, where the French give it the denomination of the *great brown cow*. The second, which we shall call *kob* ‡, is also a native of Senegal, and called the *small brown cow* by the French. The horns of the kob have a great resemblance to those of the gazelle and kevel.

* In the forests of Guzarat, every kind of game, or venison, abounds, particularly fallow deer, roebucks, *ahus*, and wild asses.—*Voyage de Mandelslo*, tom. ii. p. 195.

† The horns of the koba, or Senegal antelope, are almost close at the base, and bend out greatly a little above; they approach again towards the ends, and recede from each other towards the points, which bend backwards. The distance in the middle is six inches and a half, above that, four inches, at the points six. The length of the horns is seventeen inches, and the circumference at the bottom, eight. They are surrounded with fifteen prominent rings, and the ends are smooth and sharp. The head is large and clumsy, being eighteen inches in length; the ears are seven inches long. The head and body are of a light reddish brown. Down the hind part of the neck, there is a narrow black list. The rump is a dirty white. On each knee, and above the fetlock, there is a dusky mark. The hoofs are small. The tail is a foot long, covered with coarse black hairs, which hang far beyond the end. The length of the whole skin, which I bought at Amsterdam, was seven feet.—*Penn. Synops. Quadr.* p. 38.

‡ The horns of the *kob*, or Gambian antelope, are thirteen inches long, five inches and a half round at the bottom, very distant in the middle, and pretty close at the base and points. They are surrounded with eight or nine rings, and are smooth at their upper part.—*Penn. Synops. Quadr.* p. 39.

But the form of the head is different; the muzzle is longer, and there are no pits under the eyes. The koba is much larger than the kob. The latter is about the size of a fallow deer; and the former is as large as the stag. From the information of M. Adanson, it appears, that the koba is five feet long from the extremity of the muzzle to the origin of the tail; that the head is fifteen inches long, the ears nine, and the horns from nineteen to twenty; and that the horns are compressed on the sides, and surrounded with eleven or twelve rings; whilst those of the kob have only eight or nine rings, and exceed not a foot in length.

The seventh antelope is found in the Levant, and still more commonly in Egypt * and in Arabia. We shall call it by its Arabian name,

* Gazella Indica cornibus rectis, longissimis, nigris, prope caput tantum annulatis; cornua tres propemodum pedes longa, recta, prope imum seu basin tantum circulis seu annulis eminentibus cincta, reliqua parte tota glabra et nigricantia. Animal ipsum ad cervi platycerotis, *Damæ* vulgo dicti, magnitudinem accedit, pilo cinereo, cauda pedem circiter longa, pilis longis innascentibus hirta. Hæc *D. Tancred Robinson*, e pelle animalis suffulta in regiæ societatis museo suspensa. Cæterum hujus animalis cornua pluries vidimus in museis curiosorum. — *Raii Syn. Quad.* p. 79. *Note*, Naturalists have improperly applied the appellation of *Indian antelope* to this species. It will afterwards appear, from the evidence of travellers, that it is only found in Egypt, Arabia, and the Levant.

Gazellæ quibus Egyptus abundat. — *Prosper. Alp. Hist. Egypt.* p. 232.

*algazel**. The figure of this animal is nearly the same with that of the other antelopes, and it is about the size of the fallow deer. But its horns are very long, pretty thin, and they bend little till toward their extremities. They are black and almost smooth, the rings being very slight, except near the base, where they are better marked. They are near three feet in length, while those of the gazelle, or common antelope, exceed not one foot; those of the kevel are fourteen or fifteen inches; and those of the corine are only six or seven inches.

The eighth animal is commonly called the *bezoar antelope*†; and it is denominated *pason* by

* The bezoar antelope has very long, slender, upright horns, bending at the upper part inward towards each other; some of them are much annulated, others smoother. It is of the size of a goat, and is red, mixed with ash-colour. It inhabits the inhospitable and rough mountains of Laar in Persia, and is one of the animals which produce the bezoar.—*Pennant's Synops. of Quad.* p. 26.

Pasen, capricerva.—*Koempfer, Amœn. Exot.* p. 398.

Cornu ignotum.—*Gesner. Quad.* p. 309.

La gazelle.—*Belon. Observ.* p. 120.—*Alpin. Hist. Egypt.* tom. i. p. 232, tab. 14.

Animal bezoarticum.—*Raii Synops. Quad.* p. 80.

La gazelle du bezoar.—*Brisson, Quad.* p. 54.

Capra bezoartica, cornibus teretibus, arcuatis, totis annularibus, gula barbata.—*Linn. Syst. Nat.* p. 96.

† The Egyptian antelope has straight slender horns, near three feet long, and annulated. At their base, there is a triangular black spot, bounded on each side with white. A black line extends from the neck to the loins. The neck, back, and sides, are of a dark gray colour. The breast and belly are white. The tail is about two feet long, terminated with black

the eastern nations, which last name we shall preserve. The horns of this antelope are very well represented in the German Ephemerides *, and the figure of it is given by Koempfer †. But, in this figure, the horns are neither sufficiently long nor straight. Besides, his description is by no means exact; for he says that this bezoar animal has a beard like the he-goat, though he has given it no beard in his figure; which is more consonant to truth, the want of a beard being the chief characteristic by which the ante-

hairs. The length of the whole skin is six feet. — *Pennant's Synops. of Quad.* p. 25.

Gazella Indica cornibus rectis, longissimis, nigris, prope caput tantum annulatis. — *Raii Synops. Quad.* p. 79.

Capra gazella, cornibus teretibus, rectissimis, longissimis, basi annulatis. — *Linn. Syst. Nat.* p. 96.

Antelope Oryx. — *Linn.*

La gazelle des Indes. — *Brisson, Quad.* p. 43.

* Missum mihi Hamburgo his diebus fuit ab amico. . . . Schellamero. . . . cornu . . . capri Bezoardici. . . . Longitudine et facie qua hic depingitur, durum ac rigidum, fibris rectis per longitudinem cornu excurrentibus tanquam callis (nescio an ætatis indicibus) ad medium circiter, ubi sensum elanguescunt quasi, aut planiores redduntur, exasperatum; intus cavum, pendens uncias octo cum duabus drachmis. — *Jacobus Bontius* (lib. i. de med. Indorum, notis ad cap. 45). Videtur figuræ Bezoardici cornu mei propius accedere dum ita scribit: "Capræ istæ non absimiles valde sunt capris Europæis, nisi quod habeant erecta ac longiora cornua," &c. De cornu capri Bezoardici. — *Obs. Jo. Dan. Majoris Ephemer. ann.* 8.

† Koempfer, Amœnitates, p. 398. In Persia, this kind of antelope is very numerous, and is called *bazan*, and the stone itself *bazar*. — *Voyage de la Compagnie des Indes de Hollande,* tom. ii. p. 121.

lopes are distinguished from the goats. This antelope is of the size of our domestic he-goat, and it resembles the stag in figure, colour, and agility. Beside two separate horns, we have seen a head of this animal to which the horns were attached. The horns engraven in Aldrovandus's work have a great resemblance to those of the pasan. In general, the algazel and pasan seem to be very near allied. They likewise belong to the same climate, and are found in the Levant, Egypt, Persia, Arabia, &c. But the algazel inhabits the plains, and the pasan the mountains. The flesh of both is excellent.

The ninth antelope is an animal, which, according to M. Adanson, is called *nangueur* or *nanguer* in Senegal *. It is three feet and a half in length, and two feet and a half in height. It is of the figure and colour of a roebuck, being yellow on the upper part of the body, white on the belly and thighs, with a white spot under the neck. Its horns are permanent, like those of the other antelopes, and they exceed not six or seven inches in length. They are black and round; but, what is singular, they bend forward

* The *swift* antelope has round horns, eight inches long, and reverted at their ends. The length of the animal is three feet ten inches; the height two feet eight inches. The general colour is tawny. The belly, lower part of the sides, rump, and thighs, are white. On the fore part of the neck, there is a white spot. But this species varies in colour.

Dama.—*Plinii*, lib. xi. c. 37.

Cemas.—*Elian, An.* lib. xiv. c. 14.

Antelope dama.—*Pallas, Miscell.* v. *Spicil.* 8.

at the points nearly in the same manner as those of the chamois goat bend backward. The nanguer, or swift antelope, is a very handsome animal, and easily tamed. All these characters, and chiefly that of the horns bending forward, incline me to think that the nanguer may be the *dama*, or fallow deer of the ancients. "Cornua rupicapris in dorsum adunca, damis in adversum," says Pliny *. Now, the nanguers are the only animals whose horns are bended in this manner; we may therefore presume, that the nanguer of Africa is the dama of the ancients, especially as we learn, from another passage of Pliny †, that the dama was found only in Africa. In fine, from the testimony of other ancient authors ‡, we see that the dama was a timid, gentle animal, and had no other resources but in the swiftness of its course. The animal described and engraven by Caius, under the name of *dama Plinii*, being found, according to the testimony of the same author, in the North of Great Britain and in Spain, could not be the dama of Pliny, since he tells us, that it was only to be met with in Africa §. Besides, the animal drawn

* Hist. Nat. lib. xi. cap. 37.

† Sunt et damæ, et pygargi, et strepsicerotes. . . Hæc transmarini situs mittunt. — *Hist. Nat.* lib. viii. cap. 53.

‡ Horace, Virgil, Martial, &c.

§ Hæc icon damæ est quam ex caprarum genere indicat pilus, aruncus, figura corporis atque cornua, nisi quod his in adversum adunca, cum cæteris in aversum acta sint. Capræ magnitudine est dama et colore Dorcadis. . . . Est amicus quidam meus Anglus, qui mihi certa fide retulit in partibus

by Caius has a beard like a goat; but none of the ancients mention the dama as having a beard. Hence I am led to think, that the dama described by Caius is only a goat, whose horns, being a little bended at the points, like those of the common antelope, made him imagine it to be the dama of the ancients. Besides, the horns bended forward, which is the distinguishing character of the dama of the ancients, are well marked in the nanguer of Africa only. We are likewise informed by M. Adanson, that there are three varieties of those nanguers, which differ only in colour; but all their horns are more or less bended forward.

The tenth gazelle is an animal very common in Barbary and Mauritania, and is called *the antelope** by the British, which name I shall pre-

Britanniæ septentrionalibus eam reperiri, sed adventitiam. Vidit is apud nobilem quemdam cui dono dabatur; accepi a quibusdam eam in Hispania nasci. — *Caius et Gesner, Hist. Quad.* p. 306.

* The *common antelope* has upright horns, twisted spirally, and surrounded almost to the top with prominent rings: they are about sixteen inches long, and twelve inches distant between point and point. In size, it is rather less than the fallow deer or buck. The colour is brown mixed with red, and dusky. The belly and inside of the thighs are white. The tail is short, black above, and white beneath. The females want horns. — *Pennant's Synops. of Quad.* p. 32.

Strepsiceros. — *Plinii Hist. Nat.* lib. viii. c. 53; et lib. xi. c. 37.

Gazelle. — *Mem. pour servir à l'Hist. des Animaux*, part i. p. 95, fig. 11.

Gazelle Africana, the antelope. — *Raii Synops. Quad.* p. 79.

serve. It is of the size of our largest roebucks. Though it has a great resemblance to the gazelle and kevel, yet it differs in so many characters, that it ought to be regarded as a distinct species. The pits below the eyes are larger in the *antelope* than in the gazelle. Its horns are almost fourteen inches long; and, though they nearly touch at the base, yet their points are fifteen or sixteen inches asunder. They are surrounded with rings and half rings, which are less raised than those of the gazelle and kevel; and, what is peculiar to the *antelope*, its horns have a remarkably beautiful double flexion, which gives them the appearance of the ancient lyre. The hair of the *antelope*, like that of the other gazelles, is yellow on the back, and white on the belly: but these two colours are not separated below the flanks by a brown or black band, as in the gazelle, kevel, corine, &c. We have only a skeleton of this animal in the Royal Cabinet.

In the *antelope*, as well as the other gazelles, there seem to be different races. 1. In the Royal Cabinet, there is a horn which can only be attributed to an antelope of a much larger size than that we have been describing. We shall

Hircus cornibus teretibus, dimidiato annulatis, bis arcuatis. — *Brisson, Quad.* p. 44.

Tragus strepsiceros. — *Klein. Quad.* p. 18.

Capra cervicapra, cornibus teretibus, dimiato-annulatis, flexuosis, contortis.—*Linn. Syst. Nat.* p. 96.

Antilope cervicapra. — *Pallas, Miscell.* p. 9. *Spicil.* 18. tab. 1 et 2.

adopt the name *lidmée* *, which, according to Dr. Shaw †, the Africans apply to the *antelopes*.

2. We have seen in the cabinet of the marquis de Marigny, whose taste extends both to the fine arts and to the history of Nature, a kind of offensive weapon, composed of two sharp horns, about a foot and a half long, which, from their double flexion, appear to belong to an *antelope* smaller than the others ‡. It must be very common in India; for the priests § carry this

* The lidmée, or brown antelope, is less than a roebuck; its horns resemble those of the last. Its face, back, and sides, are of a very deep brown, the last bordered with tawny. The belly and inside of the legs are white. Above each hoof, there is a black spot. The tail is black above, and white beneath. — *Pennant's Synops. of Quad.* p. 32.

† Besides the common gazelle or antelope (which is well known in Europe), this country likewise produceth another species, of the same shape and colour, though of the bigness of our roebuck, and with horns sometimes of two feet long. This the Africans call *lidmée*, and may, I presume, be the *strepsiceros* and *adace* of the ancients. — *Shaw's Travels*, p. 243.

‡ Mr. Pennant calls this the *smooth-horned antelope*. — *Synops. of Quad.* p. 33.

§ The Indian antelopes are not entirely like those of other countries. They have more spirit; and are distinguishable by their horns. In the common antelopes, the horns are gray, and not half so long as those of India, which are black, and more than a foot and a half in length. They are twisted as far as the points, like a screw. The Faquirs and Santons generally carry two of them joined together in a parallel direction, and use them as small batons.—*Relat. du Voyage de Thevenot*, tom. iii. p. 111. Those in the marquis de Marigny's cabinet are neither twisted nor annulated: they seem to have been polished from one end to the other.

kind of weapon as a mark of dignity. We shall call it the *Indian antelope*, because it appears to be only a simple variety of the African species.

Thus, among the gazelles or antelopes, we have discovered twelve species, or distinct varieties. 1. The common gazelle; 2. The kevel; 3. The corine; 4. The tzeiran; 5. The koba, or great brown cow; 6. The kob, or small brown cow; 7. The algazel, or Egyptian antelope; 8. The pasan, or pretended bezoar animal; 9. The nanguer, or dama of the ancients; 10. The *antelope*; 11. The lidmée; 12. The Indian *antelope*. After a careful comparison of these twelve animals among themselves, we are led to conclude, 1. That the common gazelle, the kevel, and the corine, are only three varieties of the same species; 2. That the tzeiran, koba, and kob, the varieties of another species; 3. That the algazel and pasan are probably two varieties of the same species; and that the name of *bezoar gazelle*, which has been given to the pasan, is not a distinctive character; for I shall afterwards prove, that the oriental bezoar is not produced by the pasan alone, but by all the gazelles and goats which inhabit the mountains of Asia; 4. That the nanguers, whose horns are bended forward, and of which there are two or three varieties, have been pointed out by the ancients under the name of *dama;* 5. That the *antelopes*, which are three or four in number, and differ from all the others by the double flexion of their horns, were likewise known

to the ancients, and mentioned under the names of *strepsiceros* * and *addax*. All these animals are found in Asia and Africa. To these five principal species, which contain twelve distinct varieties, I will not add two or three other species of the New World, to which the vague name of *gazelle*, or *antelope*, has been given, though they differ from all those formerly taken notice of. This would be to augment a confusion which is already too great. In a subsequent article, we shall give the history of these American animals under their true names, *mazame*, *temamaçame*, &c., and shall here confine ourselves entirely to the animals of this genus which are found in Africa and Asia: for the same reason, we shall refer to the following article several other African and Asiatic animals, which have been regarded as antelopes or goats, though they appear to be intermediate species, such as the bubalus, or Barbary cow, the condoma, the guib, the grimm, &c., without including the chevrotains, or musks, which have a great resemblance to the smallest goats or antelopes: of these last we shall likewise make a separate article.

It is now easy to perceive the difficulty of arranging and distinguishing all these animals, which are thirty in number, ten goats, twelve or thirteen antelopes, three or four bubali, and as many musks. Many of them were unknown

* Erecta autem cornua, regarumque ambitu contorta, et it leve fastigium exacuta (ut lyrus diceres) strepsiceroti, quem addacem Africa appellat. — *Plin. Hist. Nat.* lib. xi. cap. 37.

to the naturalists, or exhibited in promiscuous groups: and the whole have been confounded with each other by travellers. This, indeed, is the third time I have written the history of these animals; and, I acknowledge, that the labour overbalanceth the produce. I have the satisfaction, however, of having made every possible use of the knowledge and materials I could acquire.

With regard to the gazelles, from comparing all that has been said of them, both by the ancients and moderns, with our own experience, we find, 1. That the δορκας of Aristotle is not the gazelle, but the roebuck; though the same word, δορκας, has been employed by Ælian, not only to denote the wild goats in general, but particularly the Lybian gazelle, or Barbary antelope. 2. That the *strepsiceros* of Pliny, or *addax* of the Africans, is the *antelope*. 3. That the *dama* of Pliny is the *nanguer* of Africa, and not our fallow deer, or any other European animal. 4. That the προξ of Aristotle is the same with the Ζορκες of Ælian, and the πλατυκερος of the more modern Greeks; and that the Latins have used this word, *platyceros*, to denote the fallow deer: "Animalium," says Pliny, "quorundam cornua in palmas finxit natura, digitosque emisit ex iis, unde *platycerotas* vocant." 5. That the πυγαργος of the Greeks is probably the Egyptian or Persian gazelle, that is, the *algazel* or *pasan*. The word *pygargus* is employed by Aristotle solely to denote the *white tailed eagle*; and Pliny has used the same word to denote a quadruped.

Now, the etymology of *pygargus* indicates, 1. An animal with white thighs, such as the roebucks, or gazelles; 2. A timid animal; the ancients, imagining that white thighs indicated timidity, ascribed the intrepidity of Hercules to his having black thighs. But as almost all the authors who speak of the *pygargus* as a quadruped, mention likewise the roebuck, it is obvious that the name *pygargus* can only apply to some species of gazelle different from the *dorcas Lybica*, or common gazelle, and from the *strepsiceros*, or *antelope*, which are also mentioned by the same authors. We are therefore led to conclude, that the *pygargus* denotes the algazel or Egyptian gazelle, which must have been known to the Greeks as well as the Hebrews; for we find the name *pygargus* applied, in the Septuagint version *, to a quadruped which is reckoned among the pure animals whose flesh might be eaten. Hence the Jews eat the *pygargus*, or that species of gazelle which is most common in Egypt and the adjacent countries.

Dr. Russel, in his Natural History of Aleppo, tells us, that in the neighbourhood of that city, there are two kinds of gazelles; the one, called the *mountain gazelle*, which is the most beautiful, and whose hair on the neck and back is of a deep brown colour; the other, called *the gazelle of the plains*, which is neither so nimble, nor so handsome as the first, and whose hair is of a pale colour. He adds, that the animals are so

* Deuteron. chap. xiv.

swift, and run so long, that the best hounds cannot take them, without the assistance of a falcon; that, though the gazelles are meager in winter, their flesh is excellent; that, in summer, it is loaded with fat like that of the fallow deer; that those fed in houses are not such good eating as the wild ones, &c. From the testimonies of Mr. Russel and of Hasselquist *, we learn

* Capra cervicapra. *The rock goat.*

This is larger, swifter, and wider, than the common rock goat, and can scarcely be taken without a falcon. It is met with near Aleppo. I have seen a variety of this, which is common in the East, and the horns appear different; perhaps it is a distinct species. This animal loves the smoke of tobacco, and, when caught alive, will approach the pipe of the huntsman, though otherwise more timid than any animal. This is perhaps the only creature beside man, that delights in the smell of a poisonous and stinking plant. The Arabians hunt it with a falcon (Falco gentilis, Linn.). I had an excellent opportunity of seeing this sport in Nazareth, in Galilee. An Arab, mounting a swift courser, held the falcon on his hand, as huntsmen commonly do: when we espied the rock goat, on the top of a mountain, he let loose the falcon, which flew in a direct line, like an arrow, and attacked the animal, fixing the talons of one of his feet into the cheek of the creature, and the talons of the other into its throat, extending his wings obliquely over the animal; spreading one towards one of its ears, and the other to the opposite hip. The animal, thus attacked, made a leap twice the height of a man, and freed himself from the falcon; but, being wounded, and losing its strength and speed, it was again attacked by the falcon, which fixed the talons of both its feet into the throat of the animal, and held it fast, till the huntsman coming up took it alive, and cut its throat, the falcon drinking the blood, as a reward for his labour; and a young falcon which was learning, was likewise put to the throat of the goat: by this means are young falcons taught to fix their talons in the throat

that the gazelles of Aleppo are not the common kind, but the Egyptian gazelles, whose horns are upright, long, and black, and whose flesh is extremely good; and that they are half domestic, having been often and very anciently tamed, which, of course, has given rise to a great number of varieties, or different races, as happens in all other domestic animals. These Aleppo gazelles, therefore, are the same with those we have called *algazelles*. They are still more common in Thebaid and Upper Egypt, than in the environs of Aleppo. They feed upon aromatic herbs, and the buds of trees *. They generally go in flocks, or rather in families, consisting of five or six †. Their cry is similar to that of the goat. They are not only hunted with hounds, who are assisted by falcons, but by the small ‡

of the animal, as being the properest part; for, should the falcon fix them in the creature's hip, or some other part of the body, the huntsman would not only lose his game, but his falcon also: for the animal, roused by the wound, which could not prove mortal, would run to the deserts and the tops of the mountains, whither its enemy, keeping its hold, would be obliged to follow; and, being separated from its master, must of course perish.—*Hasselquist*, p. 190.

* Relat. du Voyage fait ou Egypt, par Granger, p. 99.

† In Egypt there are a number of antelopes. . . . They commonly traverse the mountains in flocks. The hair and tail of these animals resemble those of the hind; and their fore-feet, which are short, resemble those of the fallow deer. Their horns are straight as far as the extremity, which is crooked. Their cry resembles that of the other goats.—*Voyages de Paul Lucas*, tom. iii. p. 199.

‡ Venanter non minus et gazellas quibus Egyptus abundat, quarum carnes, bonitate et gustu, capreolorum carnibus

panther, which we have called *ounce*. In some places, the gazelles are taken by means of

similes existunt. Bisulcum animal est, silvestre, sed quod facile mansuefit, capræ simile, colore igneo ad pallidum inclinante, duplici cornu, longo, introverso lunæ modo, et nigro; auribus arrectis, ut in cervis, oculis magnis, oblongis, nigris, pulcherrimis. Unde in adagio apud Egyptos dicitur de pulchris oculis *ain el gazel*, id est, oculus gazellæ: collo longo et gracili, cruribus gracilibus atque pedibus bisulcis constat. Pantheræ in desertis locis gazellas venantur, quibus aliquandiu cornibus durissimus, acutisque resistant; sed victæ eorum præda fiunt. Pili quibus conteguntur, videnter sane similes iis qui in Moschiferis animalibus spectantur: pulcherrimum est animal, quod facile hominibus redditur cicur mansuetumque. — *Prosper. Alpin. Hist. Nat. Egypt.* p. 232, tab. 14. *Note*, From the figure given by Prosper Alpinus, it is obvious that it is the *algazel* of which he is treating; and his description shows that the algazel is often, as well as the common gazelle and keval, marked with white spots, like the civet. . . . . In India there are numbers of gazelles, which resemble our fawns. They generally go in separate flocks, each consisting of five or six, and accompanied with a male, who is easily distinguished by his colour. When the hunters discover one of these flocks, they endeavour to point them out to the leopard, which they keep chained in a small cart. This cunning animal does not run straight upon them, but winds about, creeping, and concealing himself, in order to approach and surprise them; and, as he is capable of making five or six bounds with inconceivable quickness, when he thinks himself near enough, he darts upon them, tears open the throat and breast, and gluts himself with their blood, heart, and liver. But, if he misses his aim, which often happens, he remains fixed on the spot. It would be in vain to attempt to seize them by running; for they run much swifter, and continue much longer, than he can do. His master then comes gently up to him, flatters him, and throws pieces of flesh to him. By amusing the animal in this manner, he is enabled to throw a cover over his eyes: after which, he chains him,

tamed ones, with snares of ropes fixed to their horns *.

The antelopes, especially the larger kinds, are much more common in Africa than in India. They are stronger and fiercer than the other gazelles; and they are easily distinguished by the double flexion of their horns, and by the want of a black or brown band below the flanks. The middling antelopes are of the size

and replaces him on the cart. In the course of our march, one of these leopards exhibited this sport to us, which alarmed several of our people. A flock of gazelles rose in the midst of the army, and, as often happens, they accidentally passed near the two leopards, which are commonly carried along on a small cart. One of them, which was not hood-winked, made such a spring, that he broke his chain, and darted after them, but without effect. However, as the gazelles were terrified, and chased on all sides, one of them was again obliged to pass near the leopard, who, notwithstanding the whole road was embarrassed with camels and horses, and notwithstanding the common notion that this animal never attacks its prey after having once missed it, he sprung upon and seized it. — *Relat. de Thevenot*, tom. iii. p. 112.

* Instead of a leopard, a tamed gazelle is employed to catch the wild ones. Round his horns a rope is twisted in various directions, and the two ends of it are fixed under his belly. When the hunters discover a flock of gazelles, he is allowed to go and join them. But the male of the little flock advances to prevent him: this opposition he makes with his horns, which are soon entangled in the mesh of ropes. He is then seized and carried off by the hunters. — *Id. ibid.* The same art is employed in taking the females. A domestic female with a netting of cords is let loose among a flock. The wild females immediately begin to sport with her, and the horns of one of them are soon entangled; and she falls an easy prey to the Indians. — *Voyage de la Boullaye-le-Gouz*, p. 247.

of a fallow deer. Their horns are very black *, their belly pure white, and their fore-legs are shorter than the hind-legs. They are very numerous in Tremecen, Duguela, Tell, and Zaara. They are cleanly animals, and never lie down but in dry places. They are also extremely nimble, vigilant, and timorous. In open places, they look round on all sides; and, as soon as they perceive a man, a dog, or any other enemy, they fly off with full speed. But, notwithstanding this natural timidity, they have a kind of courage; for, when surprised, they stop short, and face those who attack them.

In general, the eyes of the gazelles are black, large, vivacious, and, at the same time, so beautiful, that, in the eastern nations, they are employed proverbially in praising the eyes of a fine woman †. Their limbs are finer and more delicate than those of the roebuck. Their hair is short, soft, and lustrous. Their fore-legs are not so long as the hind ones, which enables them, like the hare, to run with greater facility up than down hill. Their swiftness is equal to that of the roebuck; but the latter rather leaps than runs, whereas all the gazelles run uniformly ‡.

* L'Afrique de Marmol, tom. i. p. 53, and Shaw's Travels.

† In the neighbourhood of Alexandria, the antelopes are very numerous. This animal is a species of roebuck, whose eyes are so large, vivacious, and piercing, that they are used figuratively in praising the eyes of the ladies. —*Descript. de l'Egypt, par Maillet*, tom. ii. p. 125.

‡ The hair of the *gierans*, or *gazelles*, is like that of the fallow deer, and they run, like the dog, without leaping. In the

Most of them are yellow on the back, and white on the belly, and have a brown band which separates these two colours below the flanks. Their tails are of different lengths, but always garnished with pretty long black hair. Their ears are long, erect, pretty open in the middle, and terminate in a point. Their feet are cloven, and shaped nearly like those of the sheep. Both males and females have permanent horns; but those of the females are thinner and shorter.

These are all the facts we have been able to collect concerning the different species of gazelles, and their natural dispositions and manners. We shall now inquire with what propriety naturalists have ascribed to one of these animals only, the production of the famous stone called the *oriental bezoar*, and whether this animal be the *pasen* or *pazan*, which they have mentioned specifically under the name of the *bezoar gazelle*. In examining the figures and description* given by Koempfer, who has written

night, they come to feed in the plains, and, in the morning, return to the mountains. — *Voyage de Gemel. Car.* ii. p. 64.

* Repertus in novenni hirco lapillus voti me fecit quodammodo compotem; dico quodammodo, nam in bestia quam comes meus findebat, intestina, a me ipso diligentissime perquisita, nullum lapidem continebant. Pronior alteri apparebat fortuna qui a nobis longius remotus seram a se transfossam dum me non expectato dissecaret, lapillum reperit elegantissimum, tametsi molis perexiguæ. . . . . Adeptus lapidem, antequam adessem. — *Koempfer, Amœnit.* p. 392. Bezoard orientalis legitimus. Lapis bezoard orientalis verus et pretiosus, Persise Pasahr, ex quo nobis vox bezoard enata est. . . . Patria ejus præcipua est Pesidis provincia Laar. . . . Ferax præterea Chorasmia esse dicitur. . . . Genitrix, est fera

much on this subject, it is doubtful whether he means that the pazan or the algazel is the only

quædam montana caprini generis quam incolæ *pasen*, nostrates capricervam, nominant. . . . . Animal pilis brevibus ex cinero rufis vestitur, magnitudine capræ domesticæ, ejusdemque *barbatum* caput obtinens. Cornua fœminæ *nulla* sunt vel exigua, hircus longiora et liberalius extensa gerit, annulisque distincta insignioribus, quorum numeri annos ætatis referunt: annum undecimum vel duodecimum raro exhibere dicuntur, adeoque illum ætatis annum haud excedere. Reliquum corpus a cervina forma, colore, et agilitate nil differt. Timidissimum et maxime fugitivum est, inhospita asperrimorum montium tesqua incolens, et ex solitudine montana in campos rarissime descendens, et quamvis pluris regni regiones inhabitet, lapides tamen bezoardicos non gignit. *Casbini* (emporium est regionis *Irak*) pro coquina nobis capricervam, vel, ut rectius dicam, Hircocervum prægrandem venebat venator, qui a me quæsitus, non audivisse se respondebat bestiam illic lapidem unquam fovisse, quod et civium, quotquot percunctatus sum, testimonia confirmabant. . . . . Quæ vero partes, tametsi capricervas alant promisque, non omnes tamen herbas ferunt ex quibus depastis lapides generari, atque ii quidem æque nobiles possint, sed solus ex earum numero est mons Baarsi. . . . Nulla ibi ex prædictis bestiis datur ætate provecta quæ lapidem non contineat; cum in cæteris hujus jugi partibus (ductorum verba refero) ex denis in montium distantioribus, ex quinquagenis in cæteris, extra Larensem provinciam ex centenis vix una sit quæ lapide dotetur, eoque ut plurimum exigui valoris. In hircis lapides majores et frequentius inveniuntur quam in fœminis. Lapidem ferre judicantur annosi, valde macilenti, colla habentes longiora, qui gregem præire gestiunt. . . . . Bestiæ ut primum perfossæ linguam inspiciunt, quæ si solito deprehendatur asperior, de præsente lapide nihil amplius dubitant. Locus natalis est pylorus sive productior quarti quem vocant ventriculi fundus, cujus ad latus plica quædam sive scrobiculus, mucoso humore oblitus, lapillum suggerit: in alia ventriculi classe (prout ruminantibus distinguuntur) quam ultima

animal which produces the *oriental bezoar* *. If we consult the other naturalists and travellers, we shall be tempted to believe that all the ga-

hac inveniri negabant. . . . Credunt quos plicarum alveoli non satis amplectuntur elabi pyloro posse, et cum excrementis excerni: quin formatos interdum dissolvi rursus, præsertim longiori animalis inedia. *Clar. Jagerus* mihi testatus est se, dum in regna Golkonda degeret, gazellas vivas recenter captas manu sua perquisivisse, et contracto abdomine lapillos palpasse, in una geminos, in altera quinos vel senos. Has ille bestias pro contemplatione sua alere decreverat, camera hospicii sui inclusas; verum quod ab omni pabulo abstinerent, quasi perire quam saginari captivæ mallent, mactari eas jussit, inedia aliquot dierum macentes. Tum vero lapillos ubi exempturus erat eorum ne vestigium amplius invenit, ex quo illos a jejuno viscere, vel alio quocumque modo, dissolutos credebat. . . . Dissolutionem nullo posse negotio fieri persuadeor, si quidem certum est lapides in loco natali viventis bruti dum latent nondum gaudere petrosa quam nobis exhibent duritie, sed molliores esse et quodammodo friabiles, instar fere vitelli ovi fervente aqua ad duritiem longius excocti. Hoc propter recenter exsectus ne improvide frangatur, vel attrectus nitorem perdat, ab inventoribus consuevit ore recipi, et in eo foveri aliquandiu dum induruerit, mox gossypio involvi et asservari. Asservatio ni primis diebus caute fiant, periculum est ne adhuc cum infirmior, importuna contrectatione, rumpatur aut labem recipiat. Generationem fieri conjiciunt cum resinosa quædam ex herbis depastis concoctisque substantia ventriculorum latera occupat, quæ, egestis cibis, jejunoque viscere in pylorum confluens, circa arreptum calculum, lanam, paleamve consistat et coaguletur; ex primo circa materiam contentam flamine efformandi lapidis figura pendit, &c.—*Idem*, p. 389 et seq.

* At Golconda, the king has great store of excellent bezoars. The mountains where the goats feed which produce these stones are about seven or eight days' journey from Bagnagaar. They commonly sell at forty crowns a pound; and the longest kind are the best. They are likewise found in

zelles, wild and domestic goats, and even the sheep, indiscriminately produce this stone, the formation of which depends more, perhaps, on

certain cows, which are much larger, though not so valuable, as those produced by the goats. The bezoars extracted from a rare kind of apes, which are small and long, are in the highest estimation.—*Voyage de Thevenot,* tom. iii. p. 293. Persia produces finer bezoar stones than any other country of the world. They are extracted from the sides of certain wild he-goats, to the livers of which they are attached.—*Voyage de Feynes,* p. 44. The bezoar, that famous medicinal stone, ought to be ranked among the number of drugs. It is a tender stone, consisting of coats or pellicles, like an onion. It is found in the bodies of the wild and domestic goats along the gulf of Persia, in the province of Corasson, which is the ancient Margiana, and is incomparably better than that brought from the kingdom of Golconda. But, as the goats were brought from a distance of three days' journey, we found bezoars in some of them only, and even that in small quantities. We preserved these goats alive fifteen days. They were fed with common green herbage; but, upon opening them, nothing was found. I kept them during this time, in order to discover whether, as is alleged, it be a particular herb which heats these animals, and produces this stone in their bodies. We are told by the natives of Persia, that the more this animal pastures in parched countries, and eats dry and aromatic herbs, the bezoar is the more salutary. Corasson and the borders of the Persian gulf are the driest countries in the world. In the heart of these stones, there are always pieces of brambles, or some other vegetable, that serve as a nucleus, round which the humour that composes this stone coagulates. It is worthy of remark, that, in India, the she-goats produce bezoar; and that, in Persia, it is produced by the wedders and he-goats. The Persians esteem their own bezoar, being hotter and better concocted, as four times more valuable than the Indian kind. The former they sell at fifty-four livres the courag, which is a weight of three drachms.—*Voyage de Chardin,* tom. ii. p. 16. The oriental

the temperature of the climate, than on the nature or species of the animal. If we may believe Rumphius, Seba, and some other authors, the true oriental bezoar proceeds from apes,

bezoar comes from a northern province of the kingdom of Golconda, and is found in the stomach of the she-goats. . . . The peasants, by feeling the belly of the goat, know how many bezoars she has, and sell her in proportion to their number. This number they discover, by rubbing the sides of the stomach, with their hands, in such a manner as to bring all the contents towards the middle of it, and then they feel the stones distinctly. . . . . The bezoar, like the diamond, is valued according to its size; for, if five or six bezoars weigh an ounce, they bring from fifteen to eighteen francs. But, if one bezoar weighs an ounce, it sells at one hundred francs. I sold one of four ounces and a half at two thousand livres. . . . The merchants who traffic in bezoars, brought me six of these goats, which I examined. It must be acknowledged that these animals are beautiful, very tall, and have hair as fine as silk. . . . . I was told that one of these goats had but one bezoar in its stomach, and that others had two, three, or four, which I soon perceived to be true, by rubbing their bellies in the manner above described. These six goats had seventeen bezoars and a half, one of which was about the size of half a hazel nut. The inside resembled the soft dung of a goat. These stones grow among the dung in the animal's belly. Some of the natives told me that the bezoars were attached to the liver, and others, that they were fixed in the heart. From these vague assertions, I could not learn the truth. . . . . With regard to the bezoar produced by the ape, it is so strong, that two grains of it are reckoned equal to six of that produced by the goat: but it is very rare, and is found principally in the island of Macassar. This kind of bezoar is round: but the other is of different figures. These bezoars, which are supposed to come from the apes, are much rarer than the other kind. They are also much dearer, and in greater request; and, when one is found of the size of a nut, it sometimes sells at more than a hundred crowns. —*Voyage de Tavernier*, tom. iv. p. 78.

and not from gazelles, goats, or wedders*. But this notion of Rumphius and Seba is by no

* *De lapidibus bezoard. orientalis.* Nondum certo innotuit, quibusnam in animalibus hi calculi reperiantur; sunt qui statuant, eos in ventriculo certæ caprarum speciei generari (Raius scilicet, Gesnerus, Tavernier, &c.) . . . . Rumphius, in *Museo Amboin.* refert Indos in risum effundi audientes, quod Europæi sibi imaginentur, lapides bezoardicos in ventriculis caprarum sylvestrium generari; at contra ipsos affirmare, quod in *Simiis* crescant, nescios interim, quanam in specie simiarum, an in Bavianis dictis, an vero in Cercopithecis. Attamen id certum esse, quod ex *Succadana* et *Tambas,* sitis in insula *Borneo,* adferantur, ibique a monticolis conquisiti vendantur iis qui littus accolunt; hos vero posteriores asserere, quod in certa *Simiarum* vel *Cercopithecorum* specie hi lapides nascantur; addere interim Indos, quod vel ipsi illi monticolæ originem et loco natalia horumce lapidum nondum prope explorata habeant. Sciscitatus sum sæpissime ab illis qui lapides istos ex Indiis Orientalibus huc transferunt, quonam de animali, et quibus e locis, hi proveniant; sed nihil inde certi potui expiscari, neque iis ipsis constabat quidpiam, nisi quod saltem ab aliis acceperant. . . . . Novi esse, qui longiusculos inter et sphæricos seu oblongo-rotundos, atque reniformes, dari quid discriminis statuunt. At imaginarium hoc est. Neque enim ulla ratione intrinsecus differunt, quando confringuntur aut in pulverem teruntur, modo fuerint genuini, nec adulterati, sive demum ex simiis aut capris sylvestribus, aliisve proveniant animalibus. . . . . Gaudent hi lapides nominibus, pro varietate linguarum, variis, Lusitanis, *Pedra* seu *Caliga* de *Buzio*; Sinensibus, *Gautsjo*; Maleitis, *Culiga-Kaku*; Persis, *Pazar, Pazan*; seu *Belsahar*; Arabibus, *Albazar* et *Berzuaharth*; Lusitanis Indiæ incolis, *Pedra-Bugia* seu *Lapides-Simiarum,* juxta Koempferi testimonium, vocantur. . . . . Credibile est nasci eosdem in stomacho, quum plerumque in centro straminum lignorumve particulæ, nuclei, aut lapilli, et alia similia, inveniantur tanquam prima rudimenta circum quæ acris, viscosa, materies sese lamellatim applicat, et deinceps, crustæ instar, magis magisque aucta in

means well founded. We have seen several of these concretions, which are called *ape bezoars*. But they are totally different from the oriental bezoar, which unquestionably proceeds from a ruminating animal, and is easily distinguished, by its form and substance, from all the other bezoars. Its common colour is a greenish olive, and brownish within. The colour of what is called the *occidental bezoar*, is a faint yellow, more or less dirty. The substance of the former is more tender and porous, and that of the latter, harder, drier, and more petrified. Besides, as prodigious quantities of the oriental bezoar were consumed during the last two or three centuries, being used both in Europe and Asia, in all cases where our physicians now employ cordials and antidotes against poison, may we not presume, from this great consumption, which still continues in some degree, that the bezoar pro-

lapidem durescit. Pro varietate victus, quo utuntur animalia, ipsæ quoque lamellæ variant, successive sibi mutuo adpositæ, sensimque grandescentes. Fracto hæ facile separantur, et per integrum sæpe statum ita a se mutuo succedunt, ut decorticatum relinquant lapidem, lævi iterum et quasi expolita superficie conspicuum. Lapides bezoard, illis e locis Indiæ Orientalis venientes quibus cum Britannis commercium intercedit, pro parte minuti sunt, et rotundi, silicumque quandam speciem in centro gerunt. Alii vero teneriores, et oblongi, intus continent straminula, nucleos dactylorum, semina peponum, et ejusmodi, quibus simplex saltem, aut geminum veri lapidis stratum, satis tenue, circumpositum est. Unde in his ultra dimidiam partem rejiculi datur: et nobis quidem hi videntur veri esse simiarum lapides, utpote maturius ab hisce animantibus per anum excreti, quam ut majorem in molem potuerint excrescere.—*Seba*, vol. ii. p. 130.

ceeds from a very common animal, or rather, that it proceeds not from one, but from several species; and that it is equally extracted from gazelles, goats, and wedders; but that these animals can only produce it in the climates of India and the Levant?

From all that has been written on this subject, we have not been able to find one distinct observation, nor a single decisive argument. It only appears, from what has been said by Monard, Garcias, Clusius, Aldrovandus, Hernandes, &c., that the oriental bezoar animal is not the common domestic goat, but a species of wild goat, which they have not sufficiently characterized. In the same manner, all we can collect from Koempfer is, that the bezoar animal is a kind of wild goat, or rather gazelle, which is equally ill described. But, from the testimonies of Thevenot, Chardin, and Tavernier, we learn, that this stone is not so often extracted from the gazelles, as from the wedders, and the wild or domestic goats. These travellers merit the greater credit, because they were eye-witnesses to the facts they mention, and because, when treating of the bezoar, though they take no notice of the gazelles, yet, as they are well acquainted with these animals, and mention them in other parts of their works *, there is not the least appearance of their having been deceived. We must not, therefore, conclude, like our ancient naturalists,

* Voyage de Tavernier, tom. ii. p. 26.

that the oriental bezoar is produced solely by a particular species of gazelle. I acknowledge, that, after having examined not only the evidence of travellers, but the facts themselves, which might decide this question, I am inclined to believe that the bezoar stone proceeds equally from the most part of ruminating animals, but more commonly from goats and gazelles. It is formed of concentric coats, or strata, and frequently contains foreign substances in its centre. I endeavoured to investigate the nature of these substances, which serve as a nucleus to the bezoar, in order to discover the animal that swallowed them. In the centre of these stones, I found small flints, stones of plums and of tamarinds, seeds of cassia, and especially pieces of straw, and buds of trees. Hence I could no longer hesitate in attributing this production to animals which browse herbage and leaves.

We are persuaded, therefore, that the oriental bezoar proceeds not from any one, but from a number of different animals. Neither is it difficult to reconcile this opinion with the testimonies of travellers; for, though each of them contradicts his neighbour, yet all of them make near approaches to the truth. The bezoar was unknown to the ancient Greeks and Latins. Galen is the first who mentions its virtues against poison. The Arabians speak of the bezoar as possessing the same virtues. But neither the Greeks, Latins, nor Arabians, give any

precise information concerning the animals by which it is produced. Rabi Moses, the Egyptian, only remarks, that some people pretend that this stone is formed in the angle of the eye, and others in the gall-bladder of the eastern wedders. Now, bezoars, or concretions, are actually formed in the angles of the eyes, and in the pits below the eyes of stags and some other animals. But these concretions are very different from the oriental bezoar; and all the concretions in the gall-bladder consist of a light, oily, and inflammable matter, which has no resemblance to the substance of the bezoar. Andreas Lacuna, a Spanish physician, in his Commentaries on Dioscorides, remarks, that the oriental bezoar is extracted from a certain species of wild goat, in the mountains of Persia. Amatus Lusitanus repeats Lacuna's remark; and adds, that this mountain-goat resembles the stag. Monard, who quotes all the three, assures us in a more positive manner, that this stone is derived from the internal parts of a mountain-goat in India, to which, says he, I may give the appellation of *cervi-capra*; because it partakes both of the stag and the goat, is nearly of the size and figure of the stag, and, like the goat, has simple horns, very much bended backward *. Garcias ab

* Lapis *bezaar* varias habet appellationes; nam Arabibus *bager* dicitur, Persis *bezaar*, Indis *bezar*. . . . Iste lapis in internis partibus cujusdam animalis *capra montana*, apellati generatur. . . . . In Indiæ supra Gangem certis montibus. Sinarum regioni vicinis, anima liacervis valde similia reperiuntur, tum magnitudine, tum agilitate et aliis notis, exceptis

Horto tells us, that, in Corasson and in Persia, there is a species of he-goats*, called *pa-*

quibusdam partibus quibus cum capris magis conveniunt, ut cornibus quæ veluti capræ in dorsum reflexa habent et corporis forma, unde nomen illis inditum cervicapræ, propter partes quas cum capris et cervis similes obtinent. . . . . Est autem animal (ex eorum relatu qui ex illa regione redeuntes animal conspexerunt) in quo reperiuntur isti lapides, cervi magnitudine et ejus quasi formæ; binis dumtaxat cornibus præditum, latis et extremo mucronatis atque in dorsum valde recurvis, breves pilos habens cineracei coloris ceu admixta rufedo: in iisdem montibus aliorum etiam colorum reperiuntur. Indi vel laqueis vel decipulis illa venantur et mactant. Adeo autem ferocia sunt ut interdum Indos etiam occidant, agilia præterea et ad saltum prona: in antris vivunt gregatimque eunt; utriusque sexus mares scilicet et fœminæ inveniuntur, vocemque gemebundam edunt. Lapides autem ex interioribus intestinis aliisque cavis corporis partibus educuntur. . . . . Dum hæc scriberem quoddam animal conspectu ivi huic (ni fallor) simile, quia omnes notas mihi habere videbatur quibus modo descripta prædita sunt; est autem ex longinquis regionibus per Africam Generoso Archidiacono Nebiensi delatum: magnitudine servi, capite et ore cervino, agile instar cervi, pili et color cervo similes; corporis forma capra refert, nam magno hirco simile est, hircinos pedes habens et bina cornua in dorsum inflexa, extrema parte contorta ut hircina videantur, reliquis autem partibus cervum æmulatur. Illud autem valde admirandum quod ex turre se præcipitans in cornua cadat sine ulla noxa: vescitur herbis, pane, leguminibus, omnibusque cibis quæ illi præbentur: robustum est et ferrea catena vinctum, quia omnes funes quibus ligabatur rodebat et rumpebat.—*Nic. Monardi de Lapide Bezoar. lib. interprete Carolo Clusio.*

* Est in Corasone et Persia Hirci quoddam genus, quod *pazan* lingua Persica vocant, rufi aut alterius coloris (ego rusum et prægrandem Goæ vidi) mediocri altitudine, in cujus ventriculo fit hic lapis bezar. . . . . Cæterum non solum generatur hic lapis in Persia, sed etiam nonnullis Malacæ locis,

san *; that the oriental bezoar is generated in their stomachs; that this stone is found, not only in Persia, but likewise in Malacca, and in the Island of Cows, near Cape Comorin; and that, in great numbers of these goats, slain for the subsistence of the troops, these stones were very commonly found. On this subject, Christopher Acosta † repeats what had been said by Garcias and Monard, without offering any thing new. In fine, to omit nothing relative to the history of this stone, Koempfer, an intelligent man, and an exact observer, tells us, that, when in the province

et in insula quæ a Vaccis nomen sumpsit, haud procul a promontorio Comorim. Nam cum *in exercitus annonam mactarentur istic multi prægrandes hirci, in eorum ventriculis magna ex parte hi lapides reperti sunt.* Hinc factum est, ut quotquot ab eo tempore in hanc insulam appellant, hircos obtruncent, lapidesque ex iis tollant. Verum nulli Persicis bonitate comparari possunt. Dextri autem adeo sunt Mauritani, ut facile qua in regione nati sint singuli lapides, discernere et dijudicare possint. . . . . Vocatur autem hic lapis *pazar* a *pazan*, id est, hircorum Arabibus, tum Persis et Corasone incolis: nos corrupto nomine *bezar*, atque Indi magis corrupti *bazar* appellant, quasi dicas lapidem forensem: nam *bazar* eorum lingua forum est.—*Garcias ab Horto, Aromat. Hist. interprete Carolo Clusio,* p. 216.

* Koempfer seems to have borrowed from Monard and Garcias, the names *cervi-capra, capri-cerva,* and *pasan,* which he has given to the oriental bezoar animal.

† Generatur iste lapis in ventriculis animalium hirco fere similium, arietis prægrandis magnitudine, colore rufo, uti cervi propemodum agili, et acutissimi auditus, a Persis *panan* appellato, quod variis Indiæ provinciis, uti in promontorio Comorim, et nonnullis Malacæ locis, tum etiam in Persia et Corasone, insulisque quæ a Vacca cognomen adeptæ sunt, invenitur.—*Christophori Acosta, Aromat. liber,* cap. xxxvi. *interprete Carolo Clusio,* p. 279.

of Laar in Persia, he went with the natives of the country to hunt the buck *pasan*, which produces the bezoar, and that he saw the stone extracted; and he assures us, that the true oriental bezoar proceeds from this animal; that the buck *ahu*, of which he also gives a figure, likewise produces bezoar, but that it is of an inferior quality. From the figures he has given of the pasan and ahu, we would be induced to think, that the first represents the common gazelle rather than the true pasan; and, from his description, we should imagine his pasan to be a he-goat, and not a gazelle, because he has given it a beard like the goats. Lastly, from the name *ahu*, which he gives to his other buck, as well as from his second figure, we recognise the wild he-goat rather than the genuine ahu, which is our tzeiran, or large gazelle. What is still more singular, Koempfer, who seems willing to determine the species of the oriental bezoar animal, and who assures us that it is the wild buck called *pasan*, quotes, at the same time, a man who, he says, is very worthy of credit, and who affirms, that he felt the bezoars in the belly of the gazelle, at Golconda. Thus all the positive evidence which can be derived from Koempfer is reduced to this, that there are two species of wild mountain-goats, the pasan and ahu, which produce the bezoar in Persia, and that in India this stone is likewise found in the gazelles. Chardin remarks, that the oriental bezoar is found in the bucks and she-goats, both wild and domestic, along the Persic Gulf, and in several provinces of India; but that,

in Persia, it is also extracted from the wedders. The Dutch travellers also assert *, that it is produced in the stomachs of sheep and goats. Tavernier, who is still more positive in favour of the domestic goats, says, that their hair is as fine as silk, and that, having purchased six of these goats alive, he extracted from them seventeen entire bezoars, and a piece of another as large as half a filberd nut. He then adds, that there are other bezoars, supposed to proceed from apes, whose virtues are still stronger than those of the goat-bezoars; that they are also extracted from cows; but the virtues of these are inferior, &c. What can be inferred from this variety of evidence and opinions, unless it be allowed that the oriental bezoar proceeds not from one species, but from a number of different animals, and especially from the gazelles and goats?

With regard to the occidental bezoars, we hesitate not to pronounce, that they are produced neither by goats nor gazelles; for it will be

* In the island of Borneo, we find the famous bezoar stone, which is very precious and in great request, on account of its virtue against poison. It is formed in the stomachs of sheep or goats, round a small pustule or protuberance in the middle of the stomach, and which is found in the stone itself. . . . . A conjecture has been formed, that the bezoar which proceeds from the stomach of the sheep, and the gall-bladder stone of the hog, are produced by the operation of some particular herbs eaten by these animals. But they are found in all the countries of the East Indies, though these animals feed promiscuously upon herbage of every kind.— See *Voyage de la Compagn. des Indes de Hollande*, tom. ii. p. 121; and also *Le Voyage de Mandelslo*, tom. ii. p. 364.

shown, in the subsequent articles, that there are neither goats, gazelles, nor even any animal which approaches to this genus, throughout the whole extent of the New World. Instead of gazelles, we find roebucks alone in the woods of America; instead of wild goats and sheep, lamas and pacos *, animals totally different, are to be found in the mountains of Peru and Chili. The ancient Peruvians had no other cattle; and, at the same time that these two species were partly reduced to a domestic state, they existed, in still greater numbers, in their natural condition of liberty on the mountains. The wild lamas were called *huanacus*, and the pacos *vicunnas*, from which has been derived the name *vigogne*, that denotes the same animal with the pacos. Both the lamas and the pacos produce bezoars; but the domestic kind produce them more rarely than the wild.

M. Daubenton, who has investigated the nature of bezoar stones more closely than any other person, thinks that they are composed of the same matter as that shining coloured tartar which adheres to the teeth of ruminating animals; and it appears, from the numerous collection of bezoars in the Royal Cabinet, that there are essential differences between the oriental and occidental bezoars. Hence the goats of the East Indies, and the gazelles of Persia, are not the only animals which produce the concre-

* See vol. vi. art. Of the Animals peculiar to the New Continent.

tions called *bezoars*. The chamois *, and perhaps the wild goat of the Alps, the he-goats of Guinea †, and several American animals ‡,

* In the country of the Grisons, balls as large, and sometimes larger, than a tennis-ball, are found in the stomachs of the chamois goat. They are called *kemskougnel* by the Germans, who allege that they are as useful as the bezoar, which likewise proceeds from the stomachs of certain Indian goats.—*Travels to Italy, &c., by Jacob Spon. and George Wheeler.* Near Munich, in a village called *Lagrem*, which is at the foot of the mountains, our host showed us certain balls, or brown masses, nearly of the size of a hen's egg, which were a kind of tender, imperfect bezoar, commonly found in the stomachs of the roebucks. He assured us that these balls had great virtues, and that he often sold them to strangers at ten crowns a piece.—*Voyage des Missionaires*, tom. i. p. 129.

† In Congo and Angola, when the wild goats begin to grow old, stones, resembling the bezoar, are found in their bellies. Those found in the males are supposed to be best; and the Negroes boast of them as specifics against many distempers, and particularly against the effects of poison.—*Hist. Gen. des Voyages, par M. l'Abbé Prevost*, tom. v. p. 83.

‡ Accepimus a peritis venatoribus, reperiri lapides bezoard in ovibus illis Peruinis cornuum expertibus, quas *bicuinas* vocant (sunt enim alia cornuta, *tarucæ* vocatæ, et alias quas dicunt *guanacas*); præterea in *teuhtlalmçame* quæ caprarum mediocrium paulove majori constant magnitudine. . . . Deinde in quodam damarum genere quas *macatlchichiltic* aut *temamaçame* appellant. . . . Necnon in ibicibus quorum hic redundat copia, ut Hispanos et apud hanc regionem frequentes cervos taceam, in quibus quoque est lapidem, de quo præsens est institutus sermo, reperire: capreas etiam cornuum expertes, quas audio passim reperiri apud Peruinos, et ut summatim dicam, vix est cervorum caprearumque genus ullum, in cujus ventriculo, aliave interna parte, sua sponte, ex ipsis almoniæ excrementis, lapis hic, qui etiam in tauris vaccisque solet offendi, non paulatim concrescat et generetur, multis sensim additis et cohærescentibus membranulis, quale sunt

likewise produce bezoars: and, under this name, if we comprehend all similar concretions found in the intestines of animals, we may affirm, that most quadrupeds, except those of the carnivorous kinds, and even the crocodiles and large serpents, produce bezoars *.

To obtain a clear idea of these concretions, they must be distributed into several classes, referring to the animals which produce them, and the climates and food that are favourable to their production.

1. The stones formed in the bladder and kidneys of men and other animals, must be separated from the class of bezoars, and denominated

cæparum. Ideo non nisi vetustissimis et senio pene confectis lapides hi reperiuntur; neque ubique, sed certis statisque locis. . . . . Variis hos lapides reperies formis et coloribus; alios nempe candescentes, fuscos alios, alios luteos, quosdam cinereos nigrosque, et vitri aut obsidiani lapidis modo micantes. Hos ovi illos rotunda figura, et alios triangula, &c. — *Nard. Ant. Recchi. apud Hernand.* p. 325 et 326. In the stomach of a wild goat, called *cornera de terra* by the Spaniards, Wafer found thirteen bezoar stones of different figures, some of which resembled coral. Though perfectly green when first exposed to the air, they afterwards turned ash-coloured. — *Hist. Gen. des Voyages, par M. l'Abbé Prevost,* tom. xii. p. 638. *Nota,* This *cornera de terra* is neither a goat nor gazelle, but the *lama* of Peru.

* There is another stone, called the *stone of the hooded serpent,* a species of serpent which has a kind of hood hanging behind its head . . . and, behind this hood, the stone is found, the smallest being as large as a hen's egg. . . . These serpents frequent the coasts of Melinda, and the stones might be brought by the Portuguese sailors or soldiers, when they return from Mosambique. — *Voyage de Tavernier,* tom. iv. p. 80.

by the appellation of *calculi*, their substance being totally different from that of the bezoars. They are easily distinguished by their weight, their urinous odour, and their structure, which is neither regular, nor composed of thin concentric circles, like that of the bezoars.

2. The concretions sometimes found in the gall-bladder and liver of men and animals should not be regarded as bezoars. They may be distinguished by their lightness, their colour, and their inflammability; besides, they are not formed of concentric circles round a nucleus.

3. The balls frequently found in the stomachs of animals, and especially of the ruminating kinds, are not true bezoars. These balls, which are called *ægagropili*, are composed, internally, of hairs swallowed by the animal, when licking itself, or of hard roots which it is unable to digest; and, externally, most of them are covered with a viscid substance, which has some resemblance to bezoar. Hence the *ægagropili* have nothing in common with the bezoars but this external covering; and inspection alone is sufficient to distinguish the one from the other.

4. In temperate climates, we often find *ægagropili* in animals, but never bezoars. Our oxen and cows, the Alpine chamois *, and the Italian porcupine †, produce only *ægagropili*. The

* See note, p. 149.

† We found an ægagropilus in a porcupine sent us from Rome in the year 1763.

animals of hot countries, on the contrary, yield only bezoars. The elephant, the rhinoceros, the goats and gazelles of Asia and Africa, the lama of Peru, &c., instead of *ægagropili*, produce solid bezoars, whose size and consistence vary according to the animals and the climates under which they live.

5. The bezoars, to which so many virtues have been ascribed, are the oriental kind, and they are produced by the goats, gazelles, and sheep, that inhabit the high mountains of Asia. Bezoars of an inferior quality, which are called *occidental*, proceed from the lamas and pacas which are found in the mountains of South America. In fine, the goats and gazelles of Africa likewise yield bezoars; but they are not so good as those of Asia.

From all these facts we may conclude, in general, that the bezoars are only a residue of vegetable nourishment, which exists not in carnivorous animals, and is peculiar to those who live upon plants; that, in the southern mountains of Asia, the herbs being stronger and more exalted than in any other region of the world, the bezoars, which are the residue of them, are also superior in quality to all others; that, in America, where the heat is less intense, and the mountain herbs have not so much strength, the bezoars which proceed from them are also greatly inferior; and, lastly, that, in Europe, where the herbs are feeble, and in the plains of both continents, where they are gross, no bezoars are pro-

duced, but only *ægagropili*, which contain nothing but hairs, roots, or filaments that are too hard to be digested *.

Since I published the volume in 1764, containing an account of the goats and gazelles, some travelling naturalists have met, in Asia and Africa, with new species of these animals; detached parts of which they have figured. Dr. Pallas published a work at Amsterdam, in 1767, under the title of *Miscellanea Zoologica*; and soon after, a second and corrected edition, by that of *Spicilegia Zoologica*. These works are very satisfactory: the author has shown as much judgment as knowledge, and we have availed ourselves of his observations.

The Forsters, who accompanied Cook in his second voyage, have had the goodness to communicate some observations which they made on the Cape goats, as well as on the sea-lions, sea-bears, &c., of which they have given some well

* All bezoars are composed of concentric layers, having either a vegetable or mineral substance for the nucleus. Their figure is irregular, being rounded only in proportion to their size. The crystallization of the eastern bezoar is very regular. When one of them is broken, numerous shining transverse striæ are visible, proceeding from the centre to the circumference, and formed of bundles of different sized needles, transversely rayed by little whitish lines parallel to the layers. The eastern bezoar is particularly distinguished by this last character. *W.*

executed figures. I have thankfully received this information, and shall show that these learned naturalists have contributed greatly towards perfecting the history of these animals.

Lastly, M. Allamand, who may be considered as one of the most learned naturalists in Europe, has added, to his edition of my works, excellent remarks and good figures of some animals which I had not an opportunity to see. I here concentrate all the new communications which I have received, and join to them my own acquisitions, from the year 1760 to 1780.

Pallas gives the generic name of *antelope* to gazelles and wild goats, and says, that methodical zoologists do wrong to join the gazelles with the goats, which are farther removed than the sheep. Nature, according to him, has placed the genus of gazelles between the deer and the goats. In other respects he agrees with me, that the gazelles are found neither in Europe nor America, but in Asia, and particularly in Africa, where the species is very numerous. The chamois, says he, is the only animal which may be considered as an European gazelle, and the wild goat appears to form the shade between the goat and certain species of gazelles. The musk animal and the chevrotains, ought not, according to him, to be ranked with the gazelles, but may go between, because in both sexes the horns are wanting, and they have great teeth, or tusks, in the upper jaw.

What I have here mentioned from M. Pallas is subject to some exceptions; for there is a spe-

cies of chevrotain, the male of which has horns; and the chamois, which is said to belong to the antelopes, and not the goats, however, unites with the goats; they have often been seen to copulate, and we are assured that they have produced together: the first fact is certain, and is alone sufficient to prove that the chamois is not only of the same genus, but a species nearly allied to that of the common goat.

Besides, the goats and sheep are so nearly allied, that they may be made to produce together, as I have proved. Thus, we can hardly admit of an intermediate genus among them, just as we ought not to say, that the gazelles, whose horns are permanent in all the species, are related to the genus of roe-deer, and stags, which shed their horns annually. We shall not dwell any longer on this methodical discussion of M. Pallas, but pass to the new observations which we have made on each of these animals in particular.

THE PASAN*.

I HAVE given a figure of the gazelle-pasan, from a stuffed skin, there being only a cranium with its horns in the king's collection. M. Pallas thinks as I do, that the pasan and the algazel are but two varieties of the same species: I have said that the two species of algazel and pasan appeared to me very nearly allied to each other;

* CHARACTER SPECIFICUS.

ANTILOPE ORYX. A. cornibus rectissimis subulatis argute rugosis, corpore griseo, striga dorsale nigricante, pilo postico contrario. — *Linn. Syst. Nat. Gmel.* i. p. 189. — *Schreb.* v. pl. 257.

ANTILOPE RECTICORNIS. A. cornibus teretibus rectissimis, basi annulatis. — *Erxleb. Mamm.* p. 272.

ANTILOPE BEZOARTICA. — *Pallas, Miscell.* p. 8. — *Spicil. Zool.* i. p. 14.

CAPRA GAZELLA.—*Syst. Nat.* xii. 1. p. 96. — *Briss. Quadr.* p. 67.

LA GAZELLE-PASAN. — *Buff. Hist. Nat. par Sonn.* xxx. p. 334, pl. 16.

EGYPTIAN ANTELOPE. — *Penn. Hist. Quadr.* i. p. 75. — *Shaw's Gen. Zool.* ii. p. 312, pl. 183.

HABITAT

in Ægypto, Arabia, totoque Oriente, in India, ad Caput Bonæ Spei; in planis. *W.*

Plate 258

PASAN.

that they were of the same climate; but that nevertheless the algazel lives almost entirely in the plains, and the pasan in the mountains: it is on this difference only of the natural habits that I have conceived the two species might be founded. I have even said positively, that I imagine the algazel and the pasan to be merely two varieties of the same species; and have been much pleased to find M. Pallas of the same opinion. He says, on the subject of this last animal, that M. Houttuyn has also given a figure after M. Burmann's * pictures; but I have not had an opportunity to see those pictures, and am ignorant whether that of the pasan resembles my figure or no.

Mr. Forster says, that the gazelle-pasan is also called *cape chamois*, and *bezoar goat*, although there is another bezoar goat in the east, described by the younger Gmelin, under the name of *paseng* †, which differs from the pasan. He adds, that the horns are smaller in the female than the male, and that they are marked, near the base, with a large black semicircular band, that extends to another great patch of the same colour, covering part of the muzzle, whose extremity is gray: again, that there are two black bands which divide the muzzle, and extend to the horns; and a black line along the back, which ends at the

* Iconem hujus animalis ex Burmanianis pariter picturis edidit D. Houttuyn tabula supra citata. — Fig. 1, *Miscell. Zool.* p. 8.

† Reisen. iii. p. 493.

rump, and there forms a triangular patch: that we also see a black band between the fore-leg and thigh, and an oval spot of the same colour on the knee; that the hind-feet are likewise marked with a black spot under the bend; and that there is a black line of long hairs, the length of the neck, beneath which is found a kind of dewlap, falling on the breast: that, in short, the remainder of the body is gray, except the belly, which, as well as the feet, is whitish.

This animal, says Mr. Forster, is four feet high, measuring from the fore-legs: the horns are three feet long, and exactly resemble those we find in the description of the king's cabinet by M. Daubenton. These antelopes are not seen in troops, but only in pairs; and it appears to me to be the same animal as the *parasol* of Congo, mentioned by P. Charles of Plaisance *.

But we have yet more detailed accounts of the pasan, published in the edition which the learned professor Allamand has given of our Natural History, in Holland. What follows is entirely by him.

"M. de Buffon has followed the oriental nations in giving to the bezoar antelope the name of pasan. He had seen only the cranium with its horns, an exact description of which has been given by M. Daubenton. We often find these horns in cabinets of natural curiosities †: I placed two

* Voyage au Congo, i. p. 494.

† See Museum Wormianum, p. 339; Jacobi Mus. Reg. Hafn. p. 4; Grew, Mus. Reg. Societat. p. 24; Catal. of the Cabinet of M. Davila, i. p. 497.

in that of our university, which had been sent from the Cape of Good Hope; but the animal they belonged to was but little known till now: I am even disposed to say that it was not known at all; for I very much doubt if this is the same that has been indicated by Koempfer, by the name of *pasen*, or pasan. The description he has given disagrees in several respects *; and the figure which accompanies it, bad as it is, certainly represents another animal.

"The other authors who have spoken of the bezoar antelope, scarcely agree with each other, although they have given it the name of *pasan*. Tavernier, who saw six alive, contents himself with saying, that they are very pretty goats; very tall, and that they have hair as fine as silk †. Chardin assures us, that the bezoar is found in the bodies of wild and domestic goats, and in Persia, in the bodies of sheep ‡. Labat

* Genetrix (bezoardici lapidis) est fera quædam montana caprini generis, quam incolæ pasen, nostrates capricervam nominant, destituti voce, quæ utrumque sexum exprimat. Animal pilis brevibus ex cinereo rufis vestitur, magnitudinem capræ domesticæ, ejusdemquæ barbatum caput obtinens. Cornua fœminæ nulla sunt, vel exigua; cornua longiora et liberalius extensa gerit, annulisque distincta insignioribus, quorum numeri annos ætatis referunt; annum undecimum vel duodecimum raro exhibere dicuntur, adeoque illum ætatis annum haud excedere: reliquum corpus a cervina forma colore et agilitate nihil differt. Timidissimum et maxime fugitivum est, inhospita asperimorum montium incolens, et ex solitudine montana in campos rarissime descendens. — *Kempferi, Amœnit. Exot.* p. 398.

† Voyages de Tavernier, seconde partie, p. 389.

‡ Voyage de Chardin, iii. p. 19.

has figured the animal that contains the bezoar in Africa *; but it is copied from what Pomet has given in his Histoire des Drogues, which is a fabulous animal of the goat kind, with two or three antlers on its horns. Clusius, or rather Garcias, says that the bezoar is found in the ventricle of a kind of goat, of which he has figured a horn: it is not like that of our pasan †. Aldrovandus has figured the antelope for this animal ‡, and Klein has copied what he has said §. The author of the Natural History, published in Holland, has represented the algazel for the bezoar animal ||.

"What are we to conclude from these different descriptions, and from many others that might be added? It is, that bezoars are found in several species of goats, or of antelopes, none of which are well known; therefore, I was not wrong in saying, that the animal in question was unknown till now, and that it was perhaps different from the pasan of Koempfer. We, however, find a passable figure, though faulty in some respects, in the *Deliciæ Naturæ Selectæ* of Knorr; but this author is surely deceived in taking it for the blue goat of Kolbe: it has neither the colour, the horns, nor the hoofs.

* Nouvelle Relation de l'Afrique Occidentale, par le P. Labat, tom. iii. p. 79.

† Clusii Exotica, p. 216.

‡ Aldrov. de Quadr. Bisulc. p. 756.

§ Klein, Quadrupedum Dispositio, p. 19.

|| Natuurlyke Histoirie, &c., Eerste deels, derde stuk, pl. 24, fig. 1.

"We owe the knowledge of this fine animal to Dr. Klockner *; he had an opportunity to purchase a complete skin, which he prepared with his usual dexterity. He says, that it was sent from the Cape of Good Hope, and I don't doubt it, since the different horns in our possession came from the same place; moreover, it is probably the same animal that was killed by captain Gordon, whose authority I have more than once had occasion to cite. This officer being at a great distance from the Cape, saw a handsome goat go out of a plantation, with very long straight horns, and a head singularly variegated with glaring colours: he fired at it; and, having brought it down, ran to examine it closely; but was restrained by the Hottentot who accompanied him, and who said that these animals were very dangerous; that it often happened, that, being only wounded, or falling from fear, they suddenly rose again, and springing forward, pierced those who approached them with their horns, which are very pointed. To prevent all danger, he fired again, that he might be convinced it was quite dead. As Mr. Gordon has returned to the Cape (from whence we have many curious things to expect from him), I cannot show him the figure of our skin, to be certain that it is the same animal which he saw *.

"This animal is rather smaller than the condo-

* According to Latreille, this antelope appears to be the same that Sparrman mentions in his Travels, under the name of *gems-bok*, or *chamois*. W.

ma; the head neither resembles that of the stag nor the goat; it is more like that of M. de Buffon's nanguer; but the singular mixture of colours renders it very remarkable. The ground is a fine white; between the horns there is a broad black spot, which descends about two inches on the forehead, and, spreading on each side, advances in a point on the side of the nose: another great patch, also black, covers almost the whole of the nose; and, on the sides, is joined by two bands of the same colour, which rise from the roots of the horns, cross the eyes, and descend beneath the lower jaw, where they become brown. Similar black bands, crossing the eyes, are rare in quadrupeds: the badger and the coati are the only examples. The end of the nose is white as snow. . . . . The short hair that covers the sides, the thighs, and the crupper of this animal, is hardly less remarkable in colour; it is of an ash-gray, tending to blue, with a light blush of red; its tail is brown tipt with black: the brown colour is continued on the back, where it forms a considerable band, extending to the shoulders: the hair there appears like a star, and, continuing to cover the neck, forms a sort of mane, till it disappears on approaching the head: the lower part of the fore-legs is white; but there is an oval spot, almost black, which begins above the hoofs, and is five inches long by one broad: there is a similar spot on the hind-feet, but mixed more with white hairs; it extends along the front of the leg, like a simple line, of a colour which brightens progressively till

it is confounded with the deep brown hairs on the front of the thighs, and which appear in the form of a large band, three or four fingers wide: this band is continued on the lower part of the body, and extends to the fore-legs, upon which it descends after having surrounded them above.

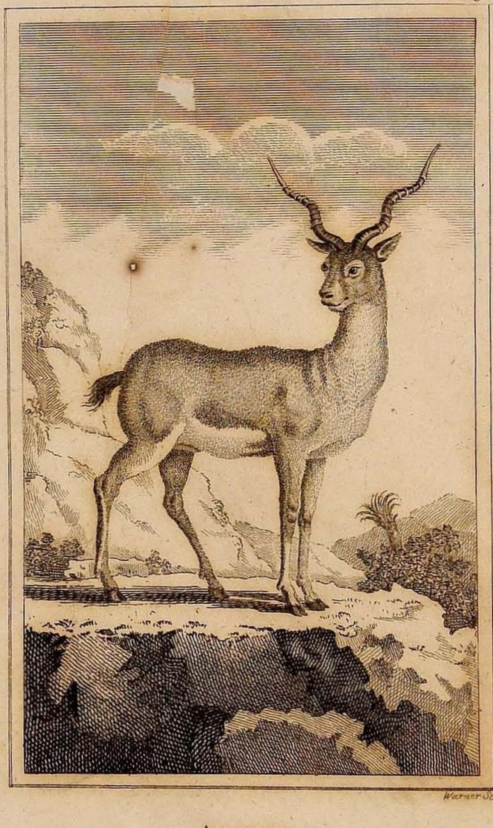
"On both sides the rump there is a large oval spot, that reaches nearly to the leg; it is covered with yellowish brown hairs tipped with white: there is a brown stripe on the neck, which extends to the fore-legs, where there are some remains of long hairs, which, it seems, had been attached to the throat.

"The ears are like those of the condoma: they are seven inches long, and four and a half broad: they are edged with brown hairs. The horns are almost straight, the curve being so slight as hardly to be perceived: they are black, and two feet and an inch long, from which I am led to believe that they had not attained their full growth. Those in our cabinet are two feet four inches long, and six inches in circumference at the base. These horns are very exactly represented in the figure which Buffon has given, and we have nothing to add to Daubenton's description: they are obliquely annulated half their length; the rest is smooth, and the tip very sharp.

"The feet exhibit a singularity that must not be omitted: the bottom of each hoof is like an elongated isosceles triangle; whereas, in other cloven footed animals, it forms almost an equilateral triangle: this conformation gives the foot of the pasan a more extended base, and a better

shape: there are two pointed false hoofs above the heel. There is something very graceful in the port of this animal; and whether we rank it in the class of gazelles, to which, from its wanting a beard, it seems to belong, or place it among the goats, it is surely a very distinguished species in the colour of its spots, as well as in its horns. The neck is shorter than in most animals of this genus, but that takes nothing from its beauty. Judging from its horns and feet, it probably inhabits the mountains, and resides at a considerable distance from the Cape, since, as yet, it has been known only to the Hottentots."

Plate 259



ANTELOPE. *Male*

Plate 260

Warner Sc

FEMALE ANTELOPE.

THE ANTELOPE*.

M. PALLAS very justly remarks, that there are animals, especially in the genus of wild goats and antelopes, the names of which, given them by the ancients, will ever remain doubtful: that of *cervicapra*, which I have said to be the same animal with the *strepsiceros* of the Greeks, or the *adax* of the Africans, ought, according to M. Pallas, to be applied to the gazelle that I

* CHARACTER SPECIFICUS.

ANTILOPE CERVICAPRA. A. cornibus spiralibus teretibus annulatis, corpore fulvescente adumbrato.—*Linn. Syst. Nat. Gmel.* i. p. 192.—*Schreb.* v. pl. 268.

Antilope cornibus spiralibus annulatis, corpore supra fusco, subtus albo.—*Erxleb. Mamm.* p. 283.

Hircus (Gazella) cornibus teretibus dimidiato-annulatis bis arcuatis.—*Briss. Quadr.* p. 68.

CAPRA BEZOARTICA.—*Aldrov. Bisulc.* p. 256.

STREPSICEROS et ADDAX.—*Plin. Hist. Nat.* xi. c. 37.

GAZELLA AFRICANA sive ANTILOPE.—*Ray's Quadr.* p. 79.

LA GAZELLE ANTILOPE.—*Buff. Hist. Nat. par Sonn.* xxxi. p. 1, fig. 1, 2.

COMMON ANTELOPE.—*Penn. Hist. Quadr.* i. p. 89.—*Shaw's Gen. Zool.* ii. p. 336, pl. 191.

HABITAT

in Africa magis boreali, et India. W.

have named antelope. He says, and with truth, that Aldrovandus has given a good figure of the horns*, and we have given, not only the horns, but the entire skeleton of the animal. I conceived then that it was one of the five which the members of the Academy of Sciences had dissected under the name of gazelle; but Pallas has given me sufficient reason to doubt this.

I have said, that there appears to be different breeds amongst the antelope kind, and I have hinted that they are found not only in Asia, but in Africa, particularly in Barbary, where they are called *tidmée*. M. Pallas says the same thing, and, to several historical facts, he adds a good description of this animal, of which the following is an extract:

"I have had an opportunity," says he, "of examining and describing the animals that lived ten years in the menagery of the prince of Orange, which, although brought from Bengal in 1755 or 1756, not only existed, but multiplied in the climate of Holland. They lived peaceably with the axis, or spotted deer, and equally brought up their little ones.

"The first male was old when it arrived, and the female was adult. This male died in 1766, but the female was then alive; and, though more than ten years of age, she had shed her horns in the preceding year. The male was very wild and untameable, the female, on the contrary, is very familiar; she will readily come

* Aldrov. Quadr. Bisulc. p. 256.

near, and follow on being presented with bread: she rises, like the axis, on the hind-feet, to reach what is held too high; however, she is soon angry with those who plague her, butting at them like a ram; her skin and hair are then seen to tremble. The young, like the father, are wild, and fly when they are approached; they go in herds, walking at first very slowly, then by short jumps; and when on full speed, they bound and spring like the stag or chamois. I never heard their voice; however, the keepers of the menagery say that, during the rutting season, the males make a sort of neighing. They feed them like the other ruminating animals; and they support our winters tolerably well. They are very cleanly, a whole flock choosing a particular spot to deposit their excrements upon. It is not determined at what time the females are in season; they are sometimes with young two months after casting their horns: they go nearly nine months, producing only one at a time, which the mother suckles, without refusing to suckle others. For the first eight days the young ones remain at rest, after which they accompany the herd. The young females follow their mothers whenever they separate from the herd. These animals grow for three years. In the first six months, there is little difference between the males and females; but afterwards the females are easily distinguished by a white band on the flanks near the back, and by a character still less equivocal; it is, that they never have horns on the head, whilst in the male we may

perceive the rudiments of horns at seven months; and these horns make two turns of a screw, with ten or twelve ridges, at the age of three years; it is then, also, that the white bands on the back and head begin to vanish, the colour of the shoulders and the back blackens, and the neck becomes yellow beneath: these colours deepen as the animal grows old. . . . . . The horns increase very slowly. . . . . . These animals, especially after death, have a slight, but not disagreeable smell, similar to that which stags and deer also exhale when they are dead. . . . . . Besides, this animal resembles the species which M. de Buffon calls the *gazelle*, by the black colour of the sides of the neck and of the body, by the tufts of hair under the knees, and in the fore-legs. It resembles the *tzeiran* and the *grimm* of M. de Buffon, because none of the females of the three species have any horns. But it varies in general from all the other antelopes, inasmuch as there is no species where the male and female, when full grown, are of such different colours as in this."

M. Pallas, at the same time, has given figures of the male and female in two separate plates, which, appearing very good, I have here copied and engraved. The following are some remarks by M. Pallas on the exterior form of this animal:

"It is nearly of the same shape as our European deer, however it differs in the form of the head, and it gives way to it in size: the nostrils are open, the intermediate part by which they are separated is bare and black. The hairs are

white on the chin, and brown round the mouth: the tongue is plain and roundish: there are eight fore-teeth; the middle ones are very large and sharp; those of the sides are more pointed. . . . The eyes are surrounded by a white circle, and the iris is of a yellowish brown; there is a white stripe before the eyes, beginning at the nostrils: the ears are of a moderate size, naked within, edged with white hairs, and covered on the outside with hair of the same colour as that of the head. . . . The legs are long and thin; but those behind are rather the longest: the hoofs are black, pointed, and pressed against each other. The tail is flat, and bare towards its origin. The hair above the neck, and at the beginning of the back, is very strong and stiff: on the belly, and on the inside of the thighs and legs, as well as at the end of the tail, it is as white as snow."

THE TZEIRAN*.

M. PALLAS justly observes that Houttuyn and Linnæus are wrong, to name this antelope *cervicapra*; the more so, as they at the same time quote the figures of the cervicapra of Dodard and Jonston, which are very different from that of our tzeiran: but M. Pallas ought to have adopted the name tzeiran, which this antelope bears in its native country, and we cannot see why he has preferred giving it that of *pigargus*. He judges, by the size of the skins, that this animal is larger than the deer. His description

* CHARACTER SPECIFICUS.

ANTILOPE LEUCOPHÆA. A. cornibus recurvatis teretiusculis annulatis, corpore cærulescente.—*Linn. Syst. Nat. Gmel.* i. p. 182.—*Schreb.* v. pl. 278.

Antilope (leucophæa) cornibus erectis retrorsum flexis, corpore supra cæruleo.—*Erxleb. Mamm.* p. 271.

BLAUE BOCK.—*Kolbe, Vorgel.* p. 141.

ANTILOPE CAPENSIS.—*Mull. Naturs. Suppl.* p. 52.

LA GAZELLE TZEIRAN.—*Buff. Hist. Nat. par Sonn.* xxxi. p. 12, pl. 3.

BLUE ANTELOPE.—*Penn. Hist. Quadr.* i. p. 74.—*Shaw's Gen. Zool.* ii. p. 355, pl. 195.

HABITAT

ad Caput Bonæ Spei. *W.*

Plate 261

TZEIRAN.

adds but little to what we have said, and the signification of the word *pigargus* cannot distinguish this antelope from the roebuck, nor even from several other antelopes that have a great white patch upon the tail.

The Forsters (father and son) have given the following account of the tzeiran:

"We were unacquainted till now," say they, "that there are tzeirans in Africa, and it appears that they affect the interior of Asia; they are found in Turkey, in Persia, in Siberia, in the neighbourhood of Lake Baikal, in Doaury, and in China. M. Pallas describes a chase wherein a great number of hunters, with bows and very blunt arrows, let fly at once on these animals, who go in troops. Although they will take to the water, swimming from their own inclination, and to seek a pasture on the other side of a river, yet they will not enter it when pursued and pressed by dogs and men; they will not even fly into the neighbouring forests, but prefer waiting for their enemies. The females are in season at the end of autumn, and bring forth in June. The males have a moderate sized oval bag under the belly, in which there is a particular orifice: these bags resemble the pouch of the musk, but they are empty, and perhaps it is only during their amours that they produce any matter by secretion. There are males, also, that have prominences to the larynx, which grow larger in proportion as the horns increase. The fawns of the tzeiran are sometimes taken, and become so tame, that they are suffered to graze in the fields,

from whence they regularly return in the evening to the stable: when domesticated, they acquire an affection for their master. The wild tzeirans go in troops, and sometimes mix with herds of cattle and other domestic animals; but they fly at the sight of man. They are of the size and colour of the roebuck, and redder than the fallow deer: the horns are black, a little compressed at the base, ringed and bent backwards for the length of a foot. The female has no horns."

To these observations of the Forsters, I shall add the description and figure of the tzeiran, which professor Allamand has published in his Dutch edition of my works on natural history *.

"In the article where I have spoken of the pasan," says this learned naturalist, "it may be seen that I strongly doubted if the animal to which I have given that name, was the same as that so called in the East; however, I have preserved this appellation, since it is probably the same as the pasan of M. de Buffon. A similar reason induced me to name the animal *tzeiran*, which is represented † (plate 63).

"By a lucky chance, Dr. Kloekner found the skin in a tradesman's shop: its horns are the same as those which M. de Buffon found in the king's cabinet, and which he supposed to belong to an antelope that the turks call *tzeiran*, and the

* Supplement, tom. iv. p. 151.

† See the Dutch edition, tom. iv. Supplement.

Persians *ahu*. He founds his opinion on its resemblance to the horns which Koempfer has given in the figure which he has engraved of the tzeiran; but this figure is so bad, that we can hardly form an idea of the animal it is intended to represent: and besides, as M. de Buffon has remarked, it does not agree with Koempfer's description *, and even in the plate, we find the name of *ahu* under the figure of the animal which in the text is called pasan, and that of pasan under the figure of the tzeiran. If the tzeiran of this author is, as M. de Buffon seems to think, the same animal called *dsheren*, that Gmelin has described in his Travels in Siberia, and of which there is a figure in the New Transactions of the Academy of Petersburg †, under the name of *caprea campestris gutturosa*; it is still more doubtful, if the horn found in the king's cabinet belongs to it, for it does not at all resemble that of the dsheren of Gmelin; at least if we may depend upon his figure, which represents it with the short horns of the gazelle, whilst, in the text, they are said to be like those of the wild goat.

"M. Pallas calls the tzeiran *antilope pygargus* ‡, and gives it horns similar to those which Buffon has supposed: however, in his description, he says, that the horns are bent in the shape of a lyre, and smaller in proportion than those of the

* Koempfer, Amœnitat. Exot. p. 404.

† See tom. v. p. 347, pl. 9.

‡ Spic. Zool. Fac. 1, p. 10.

gazelle. We have only to look at the figure which he quotes, to be convinced that it represents a very different horn from that which he describes.

"I cannot decide if the animal in question is the true tzeiran of Koempfer or not: to preserve the name, it is sufficient that the horns are like those attributed to it by M. de Buffon: this will not be doubted if we compare the horn, though mutilated, as it is figured by Daubenton, with those of our tzeiran: they are annulated in the same manner, and several of the rings divide in the shape of a fork; their curvature is also alike, and their size does not appear to differ any more than their length, as may be seen by comparing our dimensions with those recorded by M. Daubenton.

"I dare not say any thing of the horn figured in Aldrovandus (page 757). The rings of this appear to me to be different, as well as its length, thickness, and curvature: however, it is not without reason that M. de Buffon believes this to be the same as the horn which he gives to the tzeiran. This animal is ranked by Koempfer among those which contain bezoars, and Aldrovandus figures the horn in the chapter where he has noticed those animals.

"I have already remarked that we owe the discovery of our tzeiran to Dr. Klockner, and it is to him also that we are indebted for the following description. . . . .

"'This animal is of the size and figure of the

stag, but the forehead is more projecting. Its colour is of a whitish gray, in which some hairs are found tending to a black: it is quite white under the belly: the head is of a darker gray, and there is a large pale white spot before the eyes, which descends almost to the corner of the mouth: its horns form the arc of a circle, and are black, and grooved: they are ringed for three fourths of their length, and the rings are most prominent on the inside; the end of the horns is very smooth, and sharp pointed.

" 'The ears are pointed, and of a remarkable length in proportion to the head.

" 'The neck resembles that of the stag, but is rather thinner; the hairs with which it is covered, both above and below, are singularly arranged, one half being directed downwards, and the other half turned upwards: a similar arrangement takes place on the back; on the fore part they point towards the ground; behind, as far as the tail, they are placed in a contrary direction, and are of a deeper colour. There are places about the neck, of the size of a crown-piece, where the hairs are disposed in a ring, and appear to proceed from a centre, like so many rays directed rather obliquely towards the circumference of a circle.

" 'The tail is longer than in most animals of this genus, and is terminated by a tuft of hairs.

" 'The legs resemble those of the stag, but they have no brushes of hair on the knee; the fore-legs are rather shorter than those behind:

instead of false hoofs above the heel, there is a simple knob, or button.

"'In general appearance, this animal is more nearly allied to the race of goats than to any other species: if it is the tzeiran of Koempfer, its female has no horns, or none but what are very small.'"

THE BLUE GOAT*.

"THIS antelope," says Mr. Forster, "is very common at the Cape of Good Hope, where it is called blue goat: however, the colour is not entirely blue, and still less a celestial blue, as Hall has supposed in his History of Quadrupeds, but only a gray, slightly tending to bluish: this colour is occasioned merely by the reflection of the hair, which is hogged while the animal is living; but, when dead, lies flat on the body, and then all the blue entirely disappears, and nothing but a gray colour remains. This animal is larger than the European deer: its belly and feet are covered with white hairs; the tuft at the end of the tail is also white; and under each eye there is a spot of the same colour: the tail is only seven inches long: the horns are black and rather curved backwards; they have about twenty rings, and are eighteen or twenty inches long: the female is horned as well as the male."

* For the specific character, see the Tzeiran, for this is the same animal, described by Buffon under a different name. *W.*

THE ANTELOPE, OR LEAPING GOAT OF THE CAPE OF GOOD HOPE*.

WE have figured this animal after a design communicated to me by Mr. Forster, and drawn from the life. I conceive that we ought to refer it to the genus of antelopes rather than to that of goats, although it is called leaping goat. This species of antelope is so numerous in the country about the Cape (where Mr. Forster saw them), that they sometimes arrive by thousands, especially at particular seasons of

* CHARACTER SPECIFICUS.

ANTILOPE EUCHORE. A: fusco flavescens, subtus alba, fascia laterali castanea, cornibus lyratis, plaga supra caudam expansili nivea. — *Shaw's Gen. Zool.* ii. p. 344.

ANTILOPE EUCHORE. — *Forster Schreb.* p. 272.

LA GAZELLE À BOURSE SUR LE DOS. — *Buff. Hist. Nat. Suppl.* vi. p. 180, pl. 21.

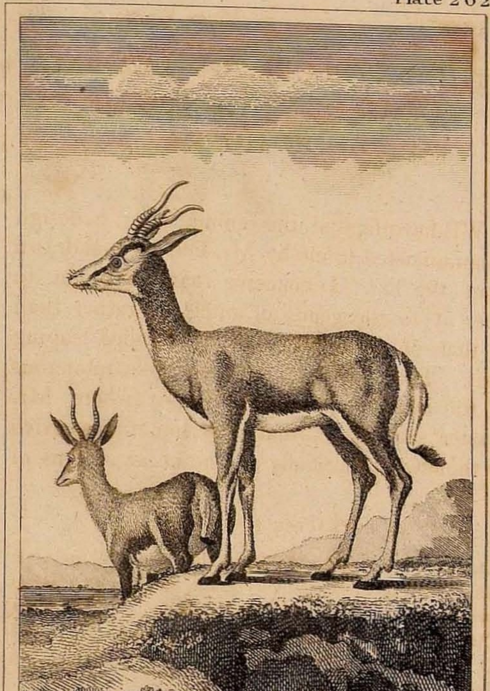
LA GAZELLE OU CHEVRE SAUTANTE, &c. — *Buff. Hist. Nat. par Sonn.* xxxi. p. 22, pl. 4.

SPRINGER ANTELOPE. — *Penn. Hist. Quadr.* i. p. 94. — *Shaw's Gen. Zool.* ii. p. 344, pl. 102.

HABITAT

ad Caput Bonæ Spei.

W.



Warner Sc.

LEAPING ANTELOPE.

the year, when they pass from one region to another. He assures me, that, having seen, during his stay in Africa, a great many antelopes of different species, he has observed that the shape and direction of the horns is not a very constant character; and that we find individuals of the same species, whose horns differ in size, and are differently twisted.

Besides, it appears, that two species of these antelopes, or leaping goats, are found at the Cape of Good Hope, for I have caused a design to be engraved in the following plate of the animal called *klippspringer*, rock leaper, of which we shall speak in the next article. In comparing its figure with that of the leaping goat, we see that the horns of the rock leaper are straighter, and not so long; the tail much shorter; the hair of a deeper gray, and more uniform than in the leaping goat: these differences appear to me more than sufficient to make two distinct species.

The following are Mr. Forster's observations on the first species of these leaping goats, which has not hitherto been well understood:

" The Dutch at the Cape of Good Hope," says he, " call these animals *springbok*, leaping goats; they inhabit the interior of Africa, and only approach the colonies of the Cape when great dryness, or the want of water and herbage, forces them to change their situation: it is then that troops are seen, from ten to fifteen thousand, although they are always accompanied

or followed by lions, ounces, leopards, and hyænas, called at the Cape *wild dogs*, which devour a great number. The advance' guard of the troop, in approaching the habitations, is in good condition; the main body is less fleshy, and the rear guard is almost starved, eating merely the roots of plants in the stony grounds; but in returning, the rear guard, in its turn, becomes fat, because it goes off first, and the former advance' guard, which is then behind, grows thinner. Moreover, these goats, when thus assembled, are not fearful, and it is only by striking them with a whip, or stick, that a man can pass through their troop. When taken young, they are easily tamed: they may be fed with milk, bread, corn, cabbage leaves, &c. The males are petulant and mischievous, even when domesticated, and will butt at strangers: when stones are thrown at them, they put themselves in a defensive posture, and often parry the blow with their horns. One of these leaping goats, three years old, which we had taken at the Cape, and which was very ferocious, grew so familiar on board ship, as to take bread from the hand, and became so fond of tobacco, that it begged it with eagerness, and appeared to relish and swallow it with avidity: we gave him a moderate quantity of tobacco in the leaf, which he eat, as well as the ribs and the stems of the leaves; but we remarked, at the same time, that the European goats, also, which we had taken on board for the sake of their milk, very willingly eat tobacco.

"The leaping goats have a long white patch, which begins by a line at the middle of the back, and ends near the rump, where it widens: this white spot on the back is not apparent when the animal is quiet, because it is covered by the long tawny hair which surrounds it; but is completely exposed when, in leaping, the antelope lowers its head.

"The leaping goats are of the size of the Bengal axis, but the body and limbs are more delicate and slender; the legs are longer: the hair in general is of a yellowish red, or of a lively cinnamon colour; the hind part of the feet, a part of the neck, the breast, the belly, and the tail, are of a fine white, except the end of the tail, which is black; the white of the belly is edged with a band of reddish brown, which extends along the side; there is also a blackish brown band which descends from the eyes to the corners of the mouth, and another yellowish red triangular band on the forehead, which sometimes descends to the muzzle, where it ends in a point, and which runs back on the top of the head, where it enlarges and unites itself to the yellowish-red of the upper part of the body; the rest of the head is of a white colour; it is of an oblong shape; the nostrils are straight, and in form of a crescent; their partition corresponds with the division of the upper lip, which is slit, and it is there that we notice a mass of little black hemispherical eminences, devoid of hair, and always moist: the eyes are large, lively, and full of fire; the iris is of a brown colour;

under the anterior angle of each eye there is a *larmicr*, with a roundish orifice: the ears are nearly as long as the head; they at first form a straight tube; afterwards they enlarge, and end in a dull point. The tail is thin, moderately long, and rather compressed on the sides; the fore-legs do not appear so high as those behind, which are diverging, so that when the animal walks, it appears to balance itself from side to side. The hoofs are small, of a triangular shape, and black colour, as well as the horns, which are about a foot long, with twelve rings, reckoning from the base; they end in a smooth point.

"It seems that the leaping goats haye some foresight of the approach of bad weather, especially when the wind from the south east, or from the Cape of Good Hope, is very stormy and violent. It is then that they leap and bound, and show the white patch on their back and rump. The oldest begin to leap, and are soon followed by all the rest of the troop. The female in this species has horns as well as the male. Finally, the horns in these animals are of such different shapes; that if we were to arrange the order of antelopes by this character, there would be leaping goats in every division."

After having compared this description by Mr. Forster, and the figure which we have here given of the leaping goat of the Cape, it appears, at first sight, to be the same animal that M. Allamand calls *bontebok*, and of which he

gives the figure and description in the new supplement to my work, printed this year 1781, at Amsterdam: however, I confess, that I still remain in some doubt about the identity of these two species, the more so, as the leaping goat is called *springerbok*, and not *bontebok*, by the Dutch at the Cape.

It may be, then, that this leaping goat, described by Mr. Forster, was of the same species, or of a species very nearly allied to that which Allamand has named the *gazelle a bourse sur le dos*; inasmuch as both agree in saying, that they perceive the white band on the back, when this goat or antelope runs or leaps, and that they do not see it when the animal is quiet.

THE KLIPPSPRINGER*.

THIS is the second species of antelope, or leaping goat, of which the Forsters have given me the drawing. "M. Kolbe is the only person," say they, "who has omitted this fine animal, the most active of its kind. It inhabits the most inaccessible rocks, and when it perceives a man, retires towards places which are surrounded with precipices. It bounds from rock to rock, over frightful abysses, and when it is pressed by dogs or hunters, it drops on the little angles of the rock, where one would hardly believe there was space enough to receive it.

* CHARACTER SPECIFICUS.

ANTILOPE OREOTRAGUS. A. cornibus rectissimis subulatis, basi parum rugosis, capite rufo, corpore ex flavo virescente subtus ex albo cinereo, cauda brevissima. — *Linn. Syst. Nat. Gmel.* i. p. 189.

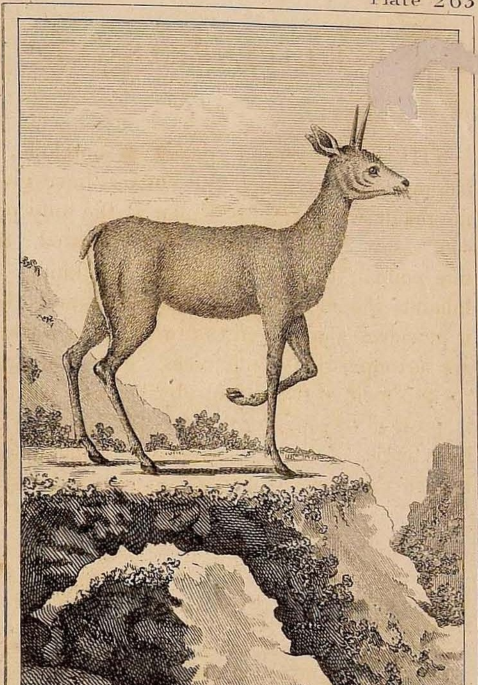
ANTILOPE OREOTRAGUS. — *Schreb.* v. pl. 259.

LE KLIPPSPRINGER ou SAUTEUR DES ROCHES. — *Buff. Hist. Nat. par Sonn.* xxxi. p. 34, pl. 5.

KLIPSPRINGER ANTELOPE. — *Penn. Hist. Quadr.* i. p. 80. — *Shaw's Gen. Zool.* ii. p. 321, pl. 183. — *Daniell's African Animals.*

HABITAT

in Africa. *W.*



KLIPPSPRINGER.

Sometimes, when the hunters can only fire at a great distance, and with a single ball, they are wounded, and fall to the bottom of the precipices. Their flesh is excellent, and is considered as the best game of the country; their hair is light, adheres slightly, and readily falls off at all times; at the Cape it is used for mattrasses, and also to quilt the women's petticoats.

"This rock springer is of the size of a common goat, but it has much longer legs: its head is round, and of a yellowish gray, marked here and there with little black stripes: the muzzle, lips, and about the eyes, are black: before each eye there is a *larmier*, with a great hole of an oval shape: the ears are of a moderate size, and end in a point: the horns are about five inches long; they are straight, and smooth at the point, but wrinkled at the base: the female has no horns: the hair of the body is of a fawn colour; each hair is white at the root, brown or black in the middle, and of a grayish yellow at the end: the feet and ears are covered with whitish hair: the tail is very short."

THE NANGUER* AND NAGOR†.

WE place these two animals together, because they have a character common to both: their horns curve forward, while in all the other species of gazelles and goats, the horns are either straight, or bend backwards. I have said, on the authority of M. Adanson, vol. xxix. p. 282, that

* CHARACTER SPECIFICUS.

ANTILOPE DAMA. A. cornibus antrorsum incurvis, corpore albo, dorso fasciaque oculari fulvis.—*Linn. Syst. Nat. Gmel.* i. p. 183.

DAMA.—*Plin. Hist. Nat.* viii. c. 53; xi. c. 37.—*Gesn. Hist. Quadr.* p. 334.—*Aldrov. Bisulc.* p. 729.—*Jonst. Quadr.* p. 75, t. 27.

NANGUER.—*Buff. Hist. Nat. par Sonn.* xxxi. p. 36, pl. 6.

SWIFT ANTELOPE.—*Penn. Hist. Quadr.* i. p. 85.

NANGUER.—*Shaw's Gen. Zool.* ii. p. 359, pl. 197.

† CHARACTER SPECIFICUS.

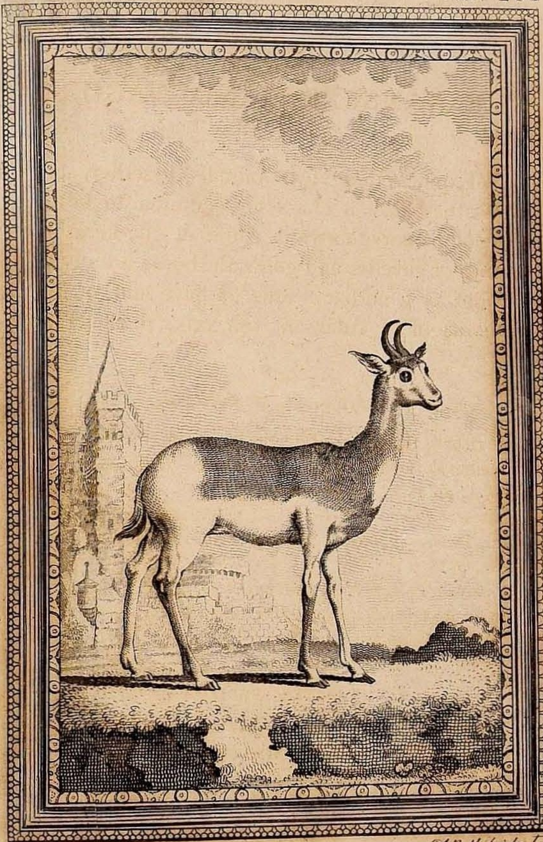
ANTILOPE REDUNCA. A. cornibus apice antrorsum recurvis, corpore rufescente subhirta.—*Linn. Syst. Nat. Gmel.* i. p. 184.

NAGOR.—*Buff. Hist. Nat. par Sonn.* xxxi. p. 36, pl. 7.

RED ANTELOPE.—*Penn. Hist. Quadr.* i. p. 85.—*Shaw's Gen. Zool.* ii. p. 360.

HABITAT

in Senegal. *W.*



A. Bell Sculpt.

NANGUER

there are three varieties, or species of these animals; the first of which, *i. e.*, the nanguer, seems to be the dama of the ancients. M. Pallas is of the same opinion; he says that both the male and female nanguer have horns, and remarks, as in the kob, a singular disposition in the teeth *.

The second species is the nagor. In his *Miscellanea Zoologica*, M. Pallas said that the nagor was the mazame of Seba, but in his *Spicilegia* he acknowledges his error, and agrees with me †, that it is not the American mazame, but an African antelope. Besides, the nanguer seems to stand alone, and without variety; but the nagor has species allied to it, for the knowledge of which I am indebted to the Forsters. They have given me the drawing of the head of one of these Cape varieties, which I think differs from my figure of the nagor: the muzzle of the Cape animal being rather more slender, and the horns somewhat less curved forwards, than the Senegal nagor. The following is their account of this subject:

"The goat called *steenbock*, or *bouquetin*, at the Cape of Good Hope, appears to be a variety of M. de Buffon's nagor. We find these animals on the prominent rocks of the Cape, and among the bushes on the flat tops of the stony moun-

* Solum hujus animalis caput cum cornibus vidi, e quo *dentium primorum* in inferiore maxilla numerum planè singularum esse didici; habet enim tantum *senos* quorum duo medii latissimi, subobliqui, recta transversa acie terminantur, laterales vero parvi, lineares sunt.—*Pall. Spicil. Zool.* p. 8.

† Hist. Nat. tom. xii. p. 326, et planche 46.

tains. They run very swiftly, and leap eight or nine feet high: great numbers are destroyed in the chase for the sake of their flesh.

"This animal is as large as a common goat, about two feet six inches high: it is red-brown on the back and sides, and dirty white under the belly. Above the eyes, under the neck, and on the buttocks, there is a sallow white spot: the ears are tawny, and round at the ends: under each eye there is a small *larmier*: the horns are five or six inches long; black, ridged at the base, smooth at the point, extremely slender, and curved forward: the tail is short, much like that of the common goat.

"Another species or variety of nagor, is an animal, which, at the Cape, they call *grysbok*, or *gray goat*: it differs from the steenbock in its colour, which is gray instead of red-brown. This grysbok is a second species of nagor; it is as large as a common goat, and has longer legs, in proportion to its body, than the steenbock. The coat appears gray only from being mixed with long white hairs; for, on a close inspection, we find the ground colour to be a reddish-brown or chesnut. The head and feet are of a clearer brown than the body, and the belly is lighter than the rest: the muzzle is black; the eyes are surrounded with the same colour: as in other goats, there are *larmiers* under the internal angles of the eyes: the ears are nearly as long as the head; they are oval, and covered on the outside with short black hairs: the horns are about five inches long; they have one or two

Plate 265

A Bell Sculp^t

NAGOR.

rings at the base, are smooth upwards, sharp pointed, curve forward, and are of a black colour.

"This species of nagor is always found on the flat tops of the mountains, among rocks, bushes, and heath. It is not so swift as the steenbock, for the dogs sometimes overtake it: the flesh is as good to eat, and we sometimes find both animals together on the mountains of the Cape.

"A third species of nagor is the *beekbok*, or *pale goat*, which resembles the steenbock, except in the colour of the hair, which is much paler, and gives the animal its name."

In comparing these three animals from the above remarks, it seems to me that there are only two distinct species; *i. e.* the nagor steenbock, and the nagor grysbok; and that the beekbok is merely a variety of the first.

THE RITBOCK*.

THIS animal appears to me to be a third variety of the species of nagor; the following is M. Allamand's description:

" The animal of which the male is represented in plate 267, and the female in plate 268, is named *rictrheebock*, by the Dutch inhabitants of the Cape of Good Hope, which they pronounce *ritrebock*. It is a compound word, signifying reed-buck: it is not a buck, therefore it is improperly named. I think that of *rictbock*, or *ritbok*, ought to remain, which signifies reed-goat; for, although it be also a compound, it does not appear so in the French. It seems impossible to

* CHARACTER SPECIFICUS.

ANTILOPE ARUNDINACEA. A. cinerea subtus alba, cornibus annulatis antrorsum incurvatis.—*Shaw's Gen. Zool.* ii. p. 347.

LE RITBOK.—*Buff. Hist. Nat. par Sonn.* xxxi. p. 41. pl. 8, 9.

RITBOCK.—*Penn. Hist. Quadr.* i. p. 87.—*Shaw's Gen. Zool.* ii. p. 347, pl. 193.

HABITAT

in Africa. W.

Plate 266

Warner Sc

RITBOK.

Plate 267

FEMALE RITBOK.

preserve that which the Hottentots have given it: they call it *a, ei, a*, pronouncing each of the three syllables with a clacking of the tongue, that we are unable to express.

"This animal is not a goat, it wants the beard; neither has it all the marks that indicate the antelopes; however, it is more nearly allied to their class than any other. Mr. Gordon, who sent me the drawings and the skin, says, that, although these animals are pretty numerous, yet they go in small herds, and sometimes only the male and female together. They live near fountains, among reeds, from whence they derive their name, and also in woods. There are some, inhabiting the mountains, of a different colour, but which, however, appear to be of the same species.

"Those of which we are now speaking, have an ash-coloured body; they are white under the throat, the belly, and the rump; but they have not the dusky, or black stripe that separates the colour of the belly from the rest of the body, as in the majority of other antelopes: the horns are black, and slightly annulated for more than half their length; I have counted ten rings on the stuffed skins which I have of these antelopes. These horns are bent forward, and end in a very sharp smooth point: they are long, for the size of the animal; being ten inches high, in a straight line, and fifteen inches long, following their curvature. The ears are also very long, and white within: there is a bare spot near each of them.

"These animals have beautiful black eyes, with *larmiers* (sinuses) beneath. They have four teats,

with two tubular holes at the sides, capable of admitting a finger: their tail is long, flat, and furnished with long whitish hairs.

"Mr. Gordon sent me another skin of this species, which exactly resembled the former in its horns, but differed in the colour, which was a very deep reddish tawny: it was, seemingly, one of those which inhabit the mountains.

"The female ritbocks are, in colour, like the males, but they are smaller, and without horns.

"We must go a considerable way into the interior of the country to find these animals. Mr. Gordon saw none within a hundred leagues of the Cape."

THE KEVEL*.

M. PALLAS appears to me to deceive himself, in asserting that the kevel and the corine are not two distinct species, but the *male and female of the same kind of antelope*: if this learned naturalist had attended to my description of the two sexes, he would not have fallen into this mistake.

* CHARACTER SPECIFICUS.

ANTILOPE KEVELLA. A. cornibus lyratis, majusculis, compressis, tergore fulvescente, strigis pallidis, fascia laterali nigrescente. — *Linn. Syst. Nat. Gmel.* i. p. 187. — *Schreb.* v. pl. 270.

LA GAZELLE KEVEL. — *Buff. Hist. Nat. par Sonn.* xxxi. p. 48.

FLAT-HORNED ANTELOPE.—*Penn. Quadr.* i. p. 92.—*Shaw's Gen. Zool.* ii. p. 351, pl. 194.

HABITAT

in Senegal. W.

THE BOSBOK*.

THIS is another very pretty antelope, described by M. Allamand, in the new supplement to my work on quadrupeds. We have here given the figure, and the words of that learned naturalist, we believe, without any omission.

"The Dutch, at the Cape of Good Hope, give the name of *bosbok* to a very pretty antelope. This word, which I have preserved, signifies

* CHARACTER SPECIFICUS.

ANTILOPE SYLVATICA. A. cornibus subspiralibus annulatis carinatis, apice lævibus acutis, corpore supra fusco, postice albo maculato, infra potissimum albo—*Linn. Syst. Nat. Gmel.* i. p. 192.—*Schreb.* v. pl. 257, B.—*Sparm. Act. Stockh.* 1780, No. 7, pl. 7.

LE BOSBOK.—*Buff. Hist. Nat. par Sonn.* xxxi. p. 49, pl. 9.

FOREST ANTELOPE.—*Penn. Hist. Quadr.* i. p. 86.

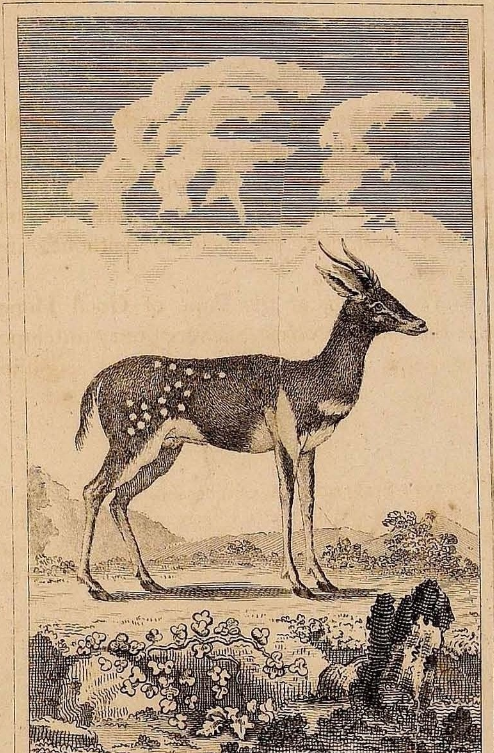
BOSBOCK.—*Shaw's Gen. Zool.* ii. p. 348, pl. 193.

HABITAT

pone Caput Bonæ Spei, in sylvis.

W.

Plate 268



BOSBOK.

wood-goat, and it is really in the forests that we find this antelope. The horns are somewhat like those of the ritbok, they are curved, and directed forward, but so slightly, as scarcely to be perceived; however, if it was only for this difference in the curvature of the horns, I should not hesitate to consider the bosbok as a variety in the species of ritbok; but they differ so much in other respects, that it can hardly be doubted that they belong to two distinct families.

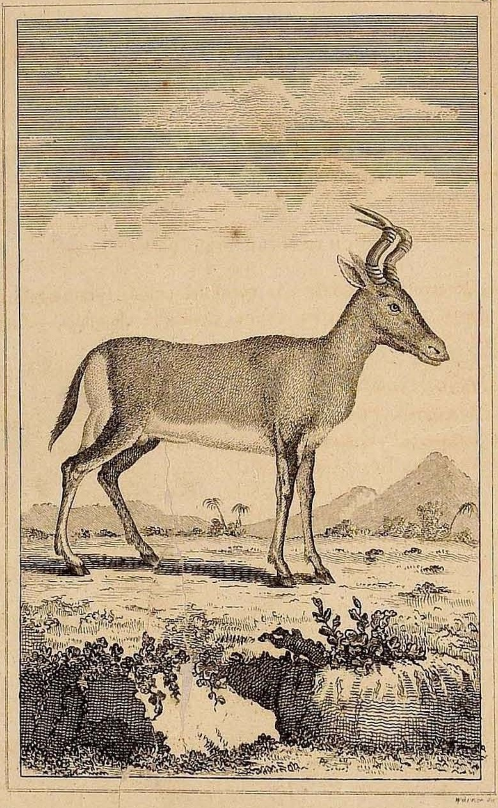
"The bosbok is smaller than the ritbok; its body is three feet three inches long, that is to say, about a foot shorter than that of the ritbok. It differs still more in the colours: the upper part of the body is of a very dark brown, tending a little to red on the head, and under the neck: its belly, as well as the inside of its thighs and legs, are white; there is also a white spot below the neck: the buttocks are not white, as in most other antelopes, but the rump is studded with little round white spots, which are particular: its horns are black, and twisted in long spirals, that reach above half their height: a black spot is seen upon the forehead: it has no *larmiers* (sinuses): its ears are long and pointed; its tail is near six inches, and furnished with long white hairs: it has four teats, and, beside them, the two pouches or tubes, that are found in the ritbok.

"The females differ from the males, inasmuch as they have no horns, and that they are somewhat redder. When Mr. Gordon sent me the drawing of this animal, he added the skin of a

female, in which I found the same white spots that are on the rump of the male.

"The bosboks are rarely found within sixty leagues of the Cape; they live, as I have already said, in the woods, where they are often heard to make a sort of barking, like that of a dog."

Plate 269



BUBALUS.

THE BUBALUS*.

IN the article Buffalo, we remarked, that the modern Latins had improperly applied to it

* CHARACTER SPECIFICUS.

ANTILOPE BUBALIS. A. cornibus crassis lyrato-contortis rugosis, apice directis capite caudaque elongatis.—*Linn. Syst. Nat. Gmel.* p. 188.

Antilope cornibus medio flexis spiralibus, faciei linea nigra. —*Erxleb. Mamm.* p. 291.

BUBALUS.—*Plin. Hist. Nat.* viii. c. 15.—*Gesn. Quadr.* p. 330.—*Aldrov. Bisulc.* p. 363.—*Johnst. Quadr.* p. 52.

ANTILOPE BUSELAPHUS.—*Pall. Miscel. Zool.* p. 7.

BUBALUS ANTIQUORUM.—*Shaw, It.* p. 151, 358.

Buselaphus Io. Caii apud Gesnerum seu Moschephalus.—*Ray's Quadr.* p. 81.

LA VACHE DE BARBARIE.—*Perr. Animal.* ii. p. 24, pl. 39, fig. bon.

CERVAS TEMAMACAMA.—*Seb. Mus.* i. p. 69, pl. 42, fig. 4.

DU BUBALE.—*Buff. Hist. Nat. par Sonn.* xxxi. p. 55, pl. 10.

HARTEBEEST.—*Sparm. Act. Stockh.* 1779, ii. No. 4, t. 5, fig. 3, Suppl.

CERVINE ANTELOPE.—*Penn. Hist. Quadr.* i. p. 102, pl. 15.—*Shaw's Gen. Zool.* ii. p. 331, pl. 184, *var.*

HABITAT

in Africa, præsertim boreali, et Arabia.

W.

the name *bubalus*. This appellation anciently belonged to the animal we are now treating of, whose nature is very different from that of the buffalo. In some external qualities it resembles the stag, the gazelles, and the ox. It resembles the stag in size and figure *, and particularly in the form of its limbs: but its horns are permanent, and nearly constructed like those of the largest gazelles, to which it is allied by this character as well as its natural dis[illegible] its head, however, is much longer than that of the gazelles, or even that of the stag. In fine, it resembles the ox in the length of the muzzle, and in the disposition of the bones of the head, which, as in the ox, jut not out behind farther than the frontal bone. These relations in external structure, joined to its ancient name being forgotten, are the reasons why, in modern times, it has obtained the compound denominations of *busephalus*, *bull-stag*, bucula-cervina, *cow hind*, *Bar-*

The porcine antelope, with horns bending outward and backward, almost close at their base, and distant at their points; twisted and annulated; very strong and black; some of them are above twenty inches long, and above eleven in girth at the base. The head is large, and like that of an ox. The eyes are placed very high, and near the horns. The form of the body is a mixture of the stag and heifer. It is of the size of the former. The tail is rather more than a foot long, and terminated with a tuft of hair. The colour is a reddish brown.—*Penn. Synops. Quadr.* p. 37.

Βυβαλος, in Greek; *Bubalus*, in Latin; *Bubale*, in French.

* See the figure and description of the Barbary cow in the *Mem. pour servir a l'Hist. des Animaux*, part. ii. p. 24, tab. 39.

bary cow, &c. Even the name *bubalus* comes from bubulus, and has been applied to it on account of the similarity of this animal to the ox.

The head of the bubalus is narrow; the eyes are placed very high; and the front is short and narrow. The horns are large, black, permanent, and furnished with large rings. They spring near each other, but recede considerably at their extremities. They bend backward, and are twisted spirally *. His shoulders are so high, that they form a kind of bunch on the withers. The tail is nearly a foot long, and garnished with a tuft of hairs at the point. The ears are similar to those of the *antelope*. Kolbe † has given to this animal the appellation of *elk*, though it has no other resemblance to the elk than by its hair being more slender at the root than in the middle, or at the point, which is peculiar to these two animals; for, in almost every quadruped, the hair is always grosser at the root than in the middle, or at the point. The hair of the bubalus is nearly of the same colour with

* See *Mem. pour servir à l'Hist. des Animaux*, part. ii. p. 24, tab. 39.

† The African elk.—Its head is beautiful, and resembles that of the stag, but it is smaller in proportion to the size of the body. Its horns are about a foot in length. Near the head they are rugged, but straight, uniform, and pointed at the extremities. Its neck is free and beautiful. The upper lip is a little larger than the under. Its limbs are long, thin, and delicate; and its tail is about a foot in length. The hair which covers its body is soft, smooth, and of an ash-colour. The African elk weighs about four hundred pounds. — *Descript. du Cap de Bonne Esperance, par Kolbe*, tom. iii. chap. 4.

that of the elk, though it is much shorter, softer, and less bushy *. These are the only resemblances between the elk and bubalus; for they differ in every other particular. The horns of the elk are larger and heavier than those of the stag, and are likewise renewed annually. The horns of the bubalus, on the contrary, never fall off, but continue to grow during life, and resemble, in figure and texture, those of the gazelles. He resembles the gazelles still more in the figure of his body, the lightness of his head, the length of his neck, the position of his eyes, ears, and horns, and in the form and length of his tail.

* The habit of body, the legs, and the neck of this animal, give it a stronger resemblance to a stag than to a cow, of which last he has only the horns, and even these differ considerably from those of the cow. They spring very near each other; because the head is here extremely narrow; but, in the cow, the front is very large. They were about a foot long, black, bended backward, twisted spirally, and so used before and above, that the elevations of the screw were almost entirely effaced. The tail exceeded not thirteen inches in length, including the tuft of hair at the point, which was three inches long. The ears resemble those of the gazelles, the inside being garnished, in some places, with white hair; the rest was naked, and exhibited a skin perfectly black and smooth. The eyes were high, and so near the horns, that the head seemed to have no front. There were only two very thin, short teats, which render this animal very different from our cows. The shoulders were so high, that they formed a kind of bunch on the withers. . . . This animal seems rather to be the bubalus of the ancients than the small African ox described by Belon; for Solinus compares the bubalus to the stag; Oppian gives him horns turned backward; and Pliny says, that he partakes of the calf and stag. — *Mem. pour servir à l'Hist. des Animaux*, part ii. p. 25.

The gentlemen of the Academy of Sciences, to whom this animal was presented under the name of the *Barbary cow*, and who adopted that denomination, have not failed to recognise it to be the *bubalus* of the ancients. Though we have rejected this compound appellation, we hesitate not to copy here their exact description, by which it appears that this animal is not a gazelle, a goat, a cow, an elk, or a stag *, but that it is a particular and distinct species. Besides, it is the same with that described by Caius †, under the

* The bubalus is separated from the stag kind by two essential characters: 1. The horns never shed: 2. The bubalus has a gall-bladder, which is wanting in the stag, the fallow deer, the roebuck, &c. "The gall-bladder," say the gentlemen of the academy, "was placed on the right side; its internal half was attached to the liver, and the membrane which formed the external half was thin, delicate, and folded, being entirely void of gall.—*Mem. pour servir à l'Hist. des Animaux*, part ii. p. 29.

† Ex Mauritaniæ desertis locis (inquit *Joh. Caius Anglus*), ad nos adventum est animal bisulco vestigio, magnitudine cervæ, forma et aspectu inter cervam et juvencam; unde ex argumento voco *Buselaphum* seu *Bovi-cervum, Moschelaphum* seu *Buculam-cervinam*: capite et aure longa atque tenui, tibia et ungula gracili ut cervæ, ita ut ad celeritatem videatur factum animal. Cauda pedali longitudine et paulo amplius, formâ caudæ vaccinæ quam similima, sed brevitate accedens propius ad cervinam: natura quasi ambigente cervæne esset an vaccæ, per superiora rufa et lenis, per ima nigra et hirta. Colore corporis fulvo seu rufo undique pilo, sessile cuteque æquato, in fronte stellatim posito, at sub cornibus per ambitum erecto: cornibus nigris, in summum levibus, cætera rugosis, rugis ex adversa parte sibi vicinioribus, ex aversa ad duplam aut triplam latitudinem a se diductis. Ea cornua primo suo ortu digitali tantum latitudine distantia, paulatim se dila-

name of *buselaphus*; and I was surprised that the gentlemen of the academy omitted this remark, as all the characters ascribed by Caius to his *buselaphus* correspond with their Barbary cow.

In the royal cabinet there is, 1. A skeleton of the bubalus, which had been described and dissected by the gentlemen of the academy; 2. A head, which is much larger than that of the skeleton, and the horns are also thicker and longer; 3. A portion of another head, with horns as large as the former, but whose figure and direction are different. Hence, in the bubali, as well as in the gazelles, antelopes, &c., there are varieties in the size of the body and the figure of the horns. But these differences seem to be too inconsiderable to constitute distinct species.

The bubalus is very common in Barbary, and in all the northern parts of Africa. He has nearly the same dispositions with the antelopes;

tant ad mediam usque sui longitudinem et paulo ultra, qua parte distant palmos tres cum semisse, tum se reducunt leviter et recedunt rursum in aversum, it aut extrema cornua non distent nisi palmorum duorum digitum trium et semissis intervallo: longa quidem sunt pedem unum et palmum unum crassa, vero in ambitu ad radices palmos tres. Caput a vertice, qua parte linea nigra inter cornua dividitur, ad extremas nares, longum est pedem unum palmos duos et digitum unum; latum qua est latissimum, in fronte videlicet paulo supra oculorum regionum, digitos septem: crassum in ambitu qua maximum est pedem unum et palmos tres. Dentes habet octonos, ordine caret superiori et ruminat; ubera sunt duo, corpori æquata, quo constat juvencam esse necdum fœtam.—*Caius de Buselapho, Gesn. Hist. Quadr.* p. 121.

and, like them, his hair is short, his skin black, and his flesh is good to eat.

After having written this article on the bubalus, I received the following observations from M. Allamand, confirming what I have said. To these observations he has added a figure drawn from the life, which I have caused to be engraved. I shall also report in this place what Messrs. Gordon and Allamand have published in the new Supplement to my History of Quadrupeds, printed at Amsterdam, 1781.

"The bubalus is spread over all Africa; at least it is found in the southern and northern countries of that part of the world. The species is very numerous near the Cape of Good Hope, and it is also found in Barbary. The gentlemen of the Academy of Sciences have described the female under the name of Barbary cow; and M. de Buffon has proved, by reasons which appear to me convincing, that our bubalus is the true one of the ancient Greeks and Romans, who surely were unacquainted with the animals inhabiting the neighbourhood of the Cape.

"The gentlemen of the Academy of Sciences have added a very exact figure to their description of the female bubalus; but, as it is not sufficient to elucidate what I have said on its different colours, and on the shape of the horns, I have here given the figure of a male. The drawing was done from the life, for which I am indebted to Mr. Gordon, who, at the same time, sent me the skin of a female, which I have stuffed, and placed in the collection of our aca-

demy. He has, as usual, added his observations, which have furnished me with many particulars unknown to M. de Buffon; who, not having seen the bubalus, merely quoted the gentlemen of the academy: it is true, that he could not have followed better guides; but what they have said on this animal, almost amounts to an anatomical description.

"The bubalus is called *camaa* by the Hottentots, and *licama* by the Cafres: its length, from the muzzle to the tail, is six feet four inches and a half: it is four feet high: the circumference of its body, behind the fore-legs, is four feet two inches; and four feet before the hind ones. It is of a deep red colour on the back, but lighter on the sides: the belly, the rump, and the insides of the thighs and legs, are white: there is a great black patch on the outside of the thighs, which extends to the legs: a similar patch is seen on the fore-legs, which begins near the body and is continued to the hoofs, which are also black. A band of this same colour, originating at the base of the horns, and terminating at the muzzle, divides the front of the head into two equal parts. This band has been noticed by J. Caius, who has given a good description of the bubalus, called by him, *buselaphus*. It is seen only on the females, whose body is entirely covered with hairs of the same red colour. Its head is long in proportion to its body, but it is very straight, and scarcely six inches in its greatest circumference. The eyes (as the gentlemen of the academy observe) are placed very high, and

are large and spirited: they are of a bluish black colour. The horns, which spread a little on each side of the head, rise nearly straight for the height of six inches, when they come obliquely forward almost as far, and, at length, forming a new angle, they take a retrograde direction, as is expressed in the figure: they are of a black colour; and their bases, which touch each other, are six inches in circumference: they are furnished with projecting rings, which extend, but sometimes very faintly, to the height of eight or ten inches; the part which turns back, is smooth and pointed: their extremities are separated about a foot from each other. The females are smaller than the males; their horns, also, are thinner and shorter.

"These animals, like the stags, have sinuses beneath the eyes: their tail, which is more than a foot long, is furnished with long hairs, placed like the teeth of a comb.

"These antelopes, as well as the cannas, have left the inhabited parts of the Cape, and retired into the interior of the country, where they are seen running in great herds, and with a swiftness which no other animal can equal. Mr. Gordon never met with any on the mountains; those which he saw were constantly in the plains. They make a kind of sneezing noise. Their flesh is good to eat; the country people, at a distance from the Cape, cut it into very thin slices, which they dry in the sun, and then frequently eat it with other meat instead of bread.

"The females have only two teats, and, gene-

rally, they have but one fawn at a time: they bring forth in September, and sometimes also in April.

"M. Pallas has given a good description of the bubalus; and M. Zimmerman supposes, that M. de Buffon may have erred in taking this animal for the elk of Kolbe."

THE KOBA AND THE KOB*.

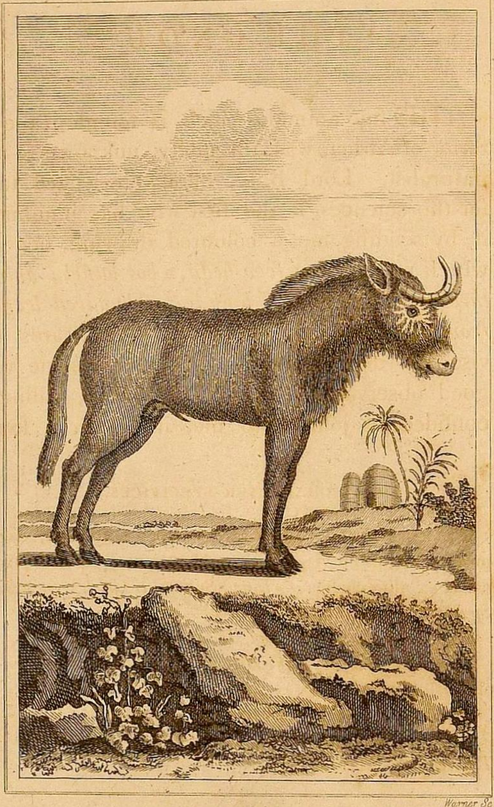
I HAVE followed M. Adanson in giving the name of *koba* to an African animal, which some travellers have called *great brown cow*, the species of which is not far removed from the bubalus. I have denominated a smaller animal *kob*, which travellers have called *little brown cow*. The koba is as large as a stag; and consequently approaches the bubalus in size, whilst the kob is not quite so large as a fallow deer. M. Pallas says, that, of all the antelopes, this appears to him to come nearest the genus *cervus*, the colour of the skin being similar. The horns are nearly a foot long: this does not agree with what M. Pallas says, who makes them only six inches; and what appears to me a proof that Pallas only measured the horns of a young specimen is, that Mr. Forster wrote to me that he had brought some horns of this animal, from the Cape of Good Hope, of the same size, and exactly resembling those represented by Daubenton in the description of the cabinet. He says that this

* Pennant describes these animals as distinct species; the koba by the name of Senegal antelope, and the kob by that of Gambian antelope.—*Hist. Quadr.* i. p. 103, 104.

W.

animal had a triangular white spot at the base of the horns; that its hair, in general, is of a red brown; and he thinks with me, that the kob is but a variety of the koba, and that both are nearly allied to the bubalus.

Plate 270



Warner Sc

GNOU.

THE GNOU*.

THIS fine animal, which is found in the interior of Africa, was, till lately, unknown to any naturalist. Lord Bute, of acknowledged taste for the sciences, is the first who has announced it, by sending me a coloured drawing, beneath which was written *feva-heda*, a *bos buffel; animal three feet and a half high: two hundred leagues from the Cape of Good Hope.* Afterwards the viscount de Querhöent, who made some very good observations in his last travels, willingly confided his journal to me, in which I found

* CHARACTER SPECIFICUS.

ANTILOPE GNU. A. cornibus basi antrorsum, versus medium retrorsum versis, corpore ferrugineo, cervice jubata, cauda ex albo cinerea. — *Linn. Syst. Nat. Gmel.* i. p. 189. — *Sparrm. Act. Stockh.* 1779, i. No. 7, pl. 3.

BOS GNOU. — *Zimmerman, Journ. Hist.* p. 53.

GNOU OU NIOU — *Buff. Hist. Nat. par Sonn.* xxxi. p. 75, pl. 10, 11.

GNOU. — *Penn. Hist. Quadr.* p. 70. — *Shaw's Gen. Zool.* ii. p. 357, pl. 196. — *Daniell's African Animals, Barrow's Travels,* i. p. 217. 2d edit.

HABITAT

in planitiebus Africæ pone Caput Bonæ Spei.

W.

another design of the same animal, under the name of *nou*, with the following short description:

"In the menagery at the Cape, I have seen a quadruped which the Hottentots called *nou*; the hair is of a very deep brown; but a part of its mane, as well as the tail, and some long hairs round the eyes, are white. It is commonly of the size of a great stag: it was brought to the Cape from the interior of the country in October, 1773. No animal of this species has as yet arrived in Europe; they never sent but one, which died on the passage. They are numerous in the interior; that which is at the Cape menagery, appears gentle enough: they feed it with bread, barley, and grass."

M. the viscount Pesciolini, has very lately, also, had the goodness to send me a coloured drawing of the same animal, which appears to me rather more exact than the others: this drawing, from which our plate is engraved, was accompanied with the following notice:

"I thought it my duty, sir, to send you a faithful copy of an animal found a hundred and fifty leagues from the principal Dutch establishment in Table Bay, at the Cape of Good Hope. It was found, with the mother, by a countryman, and taken and conducted to the Cape, where it lived only three days: it was of the size of a middling African sheep, and its mother equalled the largest. Its name is unknown, since, from the confession even of the Hottentots, its natural wildness separates it from all fre-

quented places, and its swiftness soon removes it from every eye. These details, adds M. de Venerosi, were given by M. Berg, fiscal of the Cape*."

We see that this is a very remarkable animal, not only for its size, but also for the beauty of its shape, for the mane, which is continued along the neck, for its long tufted tail, and for several other characters, which appear to assimilate it partly to the horse, and partly to the ox. We have preserved the name of *gnou* (pronounced *nou*) which it bears in its native country, and of which we are more certain than that of *feva-heda*. The following is what Mr. Forster has written to me:

"Three species of oxen are met with at the Cape of Good Hope: 1. Our common European ox; 2. The buffalo, which I have no occasion to describe, and which greatly resembles the European kind; 3. The *gnou*: this last animal is found only at a hundred and fifty, or two hundred leagues from the Cape, in the interior of Africa. They have twice attempted to send one of these animals to Holland, but it died

* Letter from the viscount Venerosi Pesciolini to M. de Buffon, dated from Port Louis, February 27, 1775. We also find the following observation on the subject of this animal in the first volume of Cook's Second Voyage. "There is another species of wild ox, called, by the natives of the country, *gnoo*; the horns of this are thin: it has a mane, and hairs upon the nose, and, by the smallness of its legs, it resembles a horse or an antelope, rather than the animals of its own species."

on the passage*. I saw a female of this species in 1775; she was three years old, and had been brought up by a colonist, who lived a hundred and sixty leagues from the Cape, where she was taken very young, together with a young male: he raised them both, and brought them as a present to the governor of the Cape. This young female, which was tamed, was lodged in a stable, and fed with brown bread and cabbage leaves; she was not quite so large as the male. She did not willingly suffer herself to be handled or caressed, and (although in other respects very tame) she would strike out with her horns and feet: we found it very difficult to measure her on account of her indocility. They told us that the gnou (in its wild state) is as intractable and mischievous as the buffalo, although it is much weaker. The young female (of which we are speaking) is gentle enough; we never heard the sound of her voice; she ruminates like an ox. She is fond of walking in the inner court, if it is not too hot; for, when the heat is excessive, she retires to the shade, or into her stable.

"This female gnou was of the size of a fallow deer, or rather of an ass; she measured forty inches in height at the withers, and thirty-nine from the hind-legs; the head was large in proportion to the body, being fifteen inches and a

* By the Dutch edition, which M. Allamand has given of my works, we find that one of these animals arrived alive at the menagery of the prince of Orange, which M. Allamand has drawn and described with his usual accuracy.

half long, from the ears to the end of the muzzle; but it was compressed on the sides, and, seen in front, it appeared straight: the muzzle was square, and the nostrils formed a crescent. There were eight cutting teeth in the lower jaw, similar in shape to those of the common ox: the eyes were very far apart, and placed on the sides of the frontal bone; they were large, of a brownish black, and appeared to have an air of ferocity and mischievousness, although education and a domestic life had softened them in the animal. The ears were about five inches and a half long, and of a similar shape to those of the common ox; the horns were ten inches long, following the curvature; they were of a black colour and cylindrical shape. The body was rounder than that of an ox, and the spine was not very apparent, that is to say, very high; so that the body of the gnou appeared in shape very like that of a horse. The shoulders were muscular, and the thighs and legs less fleshy, and finer than those of the ox. The rump was slender and raised, but flat, like the horse, towards the tail; the feet were light and thin; they had each two hoofs of a black colour, pointed before and round at the sides; the tail was twenty-eight inches long, including the long hairs at the end.

The body was entirely covered with short smooth hair, like that of the stag in colour; the part from the muzzle to the top of the eyes, was almost surrounded with long, rough, and bristly hairs, like a brush. From the horns to the

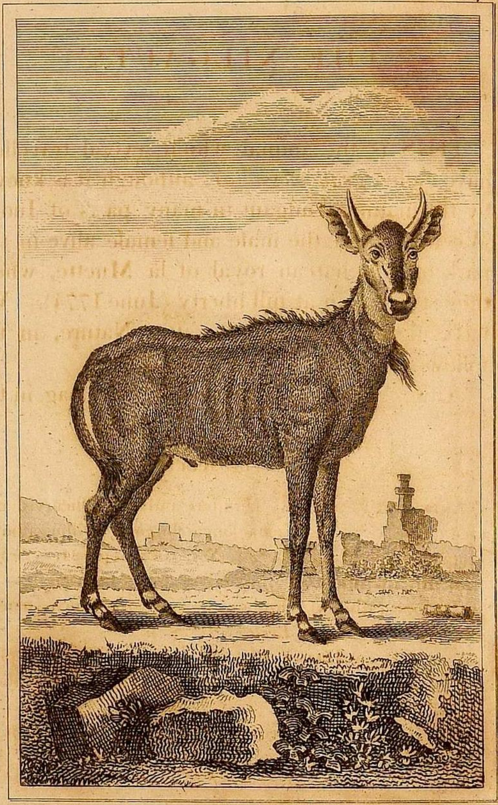
withers, it had a kind of mane formed of long hairs, whitish at the root, and black or brown at the point; under the neck was seen another stripe of long hairs, which continued from the fore-legs to the long white hairs of the lower lip; and under the belly, near the navel, it had a tuft very long: the eyebrows were of a brown black, and the eyes were completely surrounded with long bristles of a white colour *."

* To these observations, Buffon has added a dissertation on the gnoo, by professor Allamand, accompanied by a figure; to which I must refer the reader, as it is too nearly a repetition of what has been said before, to make a translation necessary. I cannot, however, dismiss the animal without observing, that neither the figure by Buffon nor Allamand is correct, if we may rely upon the pencil of Mr. S. Daniell, whose African ani[illegible] (drawn from the life) have done him so much credit. In his spirited figure of the gnoo, we find some long black hair hanging between the fore-legs, but the chest is bare. There is no tuft under the chin, as in Allamand's drawing, nor do the horns arise from the top of the head, but near the base of the ears: they are likewise of a different form and curvature. *W.*

Warner sc

FEMALE NILGAUT.

Plate 271



Warner Sc.

NILGAUT.

THE NILGAUT*.

THIS is the animal which several travellers have called *gray mogul ox*, although it is known by the name of nilgaut in many parts of India. We have seen the male and female alive in the park of the chateau royal of la Muette, where they still remain at full liberty (June 1774). We have figured them both, after Nature, in the following plates.

Although the nilgaut is like the stag in the

* CHARACTER SPECIFICUS.

ANTELOPE PICTA. A. cornibus antrorsum incurvis, cervice colloque jubatis, cauda longa floccosa, pedibus albo nigroque annulatis.—*Linn. Syst. Nat. Gmel.* i. p. 184.—*Schreb.* v. pl. 263, A. B.

Antilope (albipes) cornibus in frontem reduncis, maculis albis sopra ungulas.—*Erxleb. Mamm.* p. 280.

NYL-GHAU.—*Hunter, Phil. Trans.* vol. lxi. p. 170, pl. 5.

NIL-GAUT.—*Buff. Hist. Nat. par Sonn.* xxxi. p. 96, pl. 13, 14.

WHITE-FOOTED ANTELOPE.—*Penn. Hist. Quadr.* i. p. 83, pl. 13.

NILGHAU.—*Shaw's Gen. Zool.* ii. p. 327, pl. 189.

HABITAT

in India. *W.*

head and neck, and the ox, in the horns and tail; it is nevertheless farther removed from either of these genera, than from the antelopes, or great goats. It is in the hot climates of Asia and Africa, where the great species of antelopes and of goats are most abundant. In the same places, or at a little distance from each other, we find the condoma, the bubalus, the koba, and the nilgaut. The kind of beard under the chin and breast, the disposition of the feet and hoofs, several other affinities of conformation to the great goats, bring it nearer to this family, than to that of stags or of oxen; and, among the European animals, it may be rather compared to the chamois, than any other; but, in reality, the nilgaut is the only one of its kind, and a particular species, which is not allied to the genus of ox, of stag, of goat, of antelope, or of chamois, except by some particular characters. Like all these animals, it has the faculty of ruminating; it runs awkwardly, and worse than the stag, although its head and shoulders are light enough, but its legs are thicker and more unequal in height, the hind-legs being considerably shorter than those before: it carries its tail horizontally in running, and holds it between its legs when at rest. The male is horned, but not the female; in this respect it approaches the goat kind, in which the females are generally without horns: those of the nilgaut are hollow, and are not shed like the horns of stags, fallow deer, and roebucks, a character that completely separates it from those animals. As it comes from a much warmer cli-

mate than our own, it may, perhaps, be difficult for us to propagate it, nevertheless it is worth the trial, because, although this animal is lively, and of a wandering disposition, like the goats, it is gentle enough to be ruled, and, like them, yields eatable meat, good suet, and a thicker and closer skin. The female is browner than the male, and appears younger, but, perhaps, when old, she may become of the same gray colour.

The following is the particular description of these two animals, which I have drawn up, with M. de Seve's assistance. The male is as large as a moderate sized stag: the horns are only six inches long, by two inches nine lines thick at the base; it has no cutting teeth in the upper jaw; those of the lower jaw are large, and rather long: there is an opening between them and the grinders. The male is lower behind than before, and we find a kind of bump or elevation on the shoulders, furnished with a little mane, which rises from the top of the head, and ends at the middle of the back. There is a tuft of long black hairs on the breast. The body is entirely of a slate gray colour, but the head is more of a fawn mixed with grayish, and the hair round the eyes is of a clear reddish colour, with a little white spot at the angle of each eye: the top of the nose is brown: the nostrils are black, with a white band on the side. The ears are very large, and rayed with three black bands near the ends: the outside of the ear is of a reddish gray, with a white spot at the end. The top of the head is furnished with

black hair mixed with brown, which, in front, forms a kind of horse-shoe. There is a great white patch under the neck, near the throat. The belly is slate gray, like the body. The fore-legs and thighs are black externally, and of a gray, deeper than the body, within-side. The foot is short, and resembles the stag's: the hoofs are black. There is a white spot on the outside of the fore-feet, and two other spots of the same colour within. The hind-legs are much stronger than those before: they are covered with blackish hairs, with two great white spots on the feet, and, below, there is a curled tuft of long, chesnut-coloured hairs. The tail is of a slate gray towards the middle, white on the sides, and terminated by a tuft of long black hairs: it is bare beneath. The white hairs of the tail are very long, and are not lying down on the skin, as on the other parts of the body; on the contrary, they extend in a right line on each side.

At the veterinary school there is a stuffed skin of one of these animals, which differs from the above in the browner colour of its hair, and by the horns, which are thicker at the base, and yet shorter, being only four inches and a half long.

The female nilgaut, which was in the park of la Muette, died in October 1774, she was much smaller than the male, and at the same time stood higher on her legs; her colour was reddish, mixed with pale tawny, and red brown hairs, instead of the slate coloured coat of the male. The greatest difference between this female and its

male, was in the hind quarter, which (contrary to the male) was higher than that before; this difference might have been confined to this individual, and not common to the whole species: besides, this male and female were alike in all the other external characters, and even in the spots. They appeared to be strongly attached to each other; and, although they were completely at liberty in the park, they rarely separated, and never for a long time.

Dr. William Hunter, fellow of the Royal Society of London, has given a memoir on the nilgaut (in the Philosophical Transactions for the year 1771, vol. lxi. p. 170), accompanied by a very good figure. M. Leroi, of the Academy of Sciences, having carefully translated this, I thought it would oblige the lovers of natural history to add it in this place, especially as Dr. Hunter has observed this animal much closer than I could.

"Among the riches which, of late years, have been imported from India, may be reckoned a fine animal, the nyl-ghau; which, it is to be hoped, will now be propagated in this country, so as to become one of the most useful, or at least one of the most ornamental beasts of the field. It is larger than any ruminant of this country, except the ox; its flesh probably will be found to be delicious; and if it should prove docile enough to be easily trained to labour, its great swiftness, with considerable strength, might be applied, one would think, to valuable purposes.

"Good paintings of animals give much clearer ideas than descriptions. Whoever looks at the picture, which was done under my eye, by Mr. Stubbs, that excellent painter of animals, can never be at a loss to know the nyl-ghau, whenever he may happen to meet with it. However, I shall attempt a description of the animal; and then give as much of its history, as I have been hitherto able to learn. The account will be imperfect: yet it will give naturalists some pleasure, in the mean time, to know even a little of a large and elegant animal, which has not hitherto been described or painted.

"At first sight, the male nyl-ghau struck my imagination with being of a middle nature, between black cattle and deer: such an animal as we might suppose a mule would be, that was the produce of those species of beasts. In size, it is as much smaller than the one, as it is larger than the other; and in its form there is a very apparent mixture of resemblance to both. Its body, horns, and tail, are not unlike those of a bull; and the head, neck, and legs, are very like those of deer.

"*Colour.* The colour, in general, is ash, or gray, from a mixture of black hairs and white: most of the hairs are half white, and half black; the white part is towards the root. The colour of its legs is darker than that of its body; the same thing may be said of its head, with this particularity, that there, the darker colour is not general and uniform, but some parts are al-

most quite black. In some parts to be mentioned hereafter, the hair is of a beautiful white colour.

" *Trunk.* The height of the back, where there is a slight eminence over the shoulder-blade, is four feet and one inch; at the highest part, immediately behind the loins, it is only four feet. The general length of the trunk, as seen in a side view, from the root of the neck to the pendulous tail, is about four feet; which is nearly the height of the animal; so that, in a side view, when it stands with its legs parallel, its back and limbs make nearly three sides of a square, and the ground upon which it stands makes the fourth.

" Round the body, immediately behind the shoulder, it measures four feet and ten inches; and a little more just before the hind-legs; but this last dimension, no doubt, will vary considerably, as it happens to be more full or empty of food and drink.

" *Hair.* The hair on the body in general is thinner, more bristly, and stronger, than on our black cattle. On the belly, and upper part of the limbs, it is longer and softer, than upon the back and sides.

" *Mane.* All along the ridge, or edge of the neck and back, as far as the posterior part of the lump, which is over the shoulder-blades, the hair is blacker, longer, and more erect, making a short and thin upright mane.

" The umbilical and hypogastric regions of the belly, the inside of the thighs, and all those parts which are covered by the tail, are white. The præputium penis is not marked with a tuft

of hair; and the sheath of the penis projects very little.

"*Testicles.* The testicles are oblong and pendulous, as in a bull.

"*Tail.* The bones of the tail come down to within two inches of the top of the os calcis. The end of the tail is ornamented with long black hair, and likewise with some white, especially on the inside. On the inside of the tail, except near its extremity, there is no hair; and on the right and left there is a border of long white hair, which makes it on the inside look like a feather.

"*Legs.* The legs are small, in proportion to their length; more so than in our black cattle, and rather less so than in our deer. The length of the fore-leg is a little more than two feet and seven inches. There is one white spot on the fore part of each foot, almost immediately above the large hoofs; and another smaller white spot, before the small hoofs; above each of the small hoofs, there is a remarkable tuft of long white hair, which turns round in a flat curl. The large hoofs of the fore-leg are of an awkward length. This was very observable in every one of the five individuals of this species which I have seen; yet it was suspected to be the effect of confinement; and the examination of the hoof in the dead animal, proved that it was so.

"*Neck.* The neck is long and slender, as in deer; and when the head is raised, it has the double turn of the Italic letter *S*. At the throat, there is a shield-like spot of beautiful

white hair: and lower down, on the beginning of the convexity of the neck, there is a mane-like tuft of long, black hair.

" *Head.* The head is long and slender. From the horns, it rises upwards and backwards to join the neck. Its length from the horns only to the point of the nose, is about one foot two inches and three quarters.

" *Nose.* The partition between the nostrils was artificially perforated for fixing a cord, or bridle, according to the eastern custom of tying up or leading horned cattle. The nostrils are very long, in a direction almost parallel to the mouth, and are widest at their anterior end.

" *Mouth.* The rictus oris is long; and as far as this reaches, the lower jaw is white: so is the upper lip, as far as the nostril.

" *Teeth.* There are six grinders in each side of each jaw, and four incisor teeth in each half of the lower jaw. The first of the incisores is very broad; and the rest smaller in gradation, as they are placed more outwards or backwards.

" *Eyes.* The eyes in general are dark coloured; for all of the conjunctiva that can be commonly seen is of that complexion. In an oblique or side view, the cornea, and all that is seen through it, is blue, like burnished steel. The pupil is oval or oblong, from side to side; and the iris is almost black.

" *Ears.* The ears are large and beautiful, above seven inches in length, and spread to a considerable breadth near their end. They are white on their edge, and on their inside; except

where two black bands mark the hollow of the ear with a zebra-like variety.

"*Horns.* The horns are seven inches long; they are six inches round at their root, and, growing smaller by degrees, they terminate in a blunt point. At their root, they have three flattened sides, divided by so many angles; one of the angles is turned forwards, and consequently one of the sides backwards. This triangular shape is gradually less perceptible towards the extremity. At the root, there are slight circular wrinkles, in proportion to the age of the animal. The body and point of the horn are smooth, and the whole of a very dark colour. They rise upwards, forwards, and outwards, at a very obtuse angle, with the forehead or face. They are greatly bended, and the concavity is turned inwards, and a little forwards. The distance between them at the roots is three inches and a quarter, at the points six inches and a quarter, and at their most hollow middle parts less than six inches.

"*Food.* It eats oats, but not greedily; is fonder of grass and hay *; but is always delighted with wheat bread. When thirsty, it would drink two gallons of water.

"*Dung.* Its dung is in the form of small round balls, of the size of a nutmeg, and it passes a quantity of these together, with a rushing sound.

* "General Carnac informs me that no hay is made in India; their horses are fed with grass fresh cut, and a grain of the pulse kind, called gram."

"*Manners.* Though it was reported to have been exceedingly vicious, it was in reality a most gentle creature while in my custody, seemed pleased with every kind of familiarity, always licked the hand which either stroaked or gave it bread, and never once attempted to use its horns offensively. It seemed to have much dependance on its organs of smell, and snuffed keenly, and with noise, whenever any person came within sight. It did so likewise when any food or drink was brought to it; and was so easily offended with a smell, or so cautious, that it would not taste the bread which I offered, when my hand had touched oil of turpentine or spirits *.

"Its manner of fighting is very particular: it was observed at lord Clive's, where two males were put into a little inclosure; and it was related to me by his lordship, thus: While they were at a considerable distance from each other, they prepared for the attack, by falling down upon their fore-knees; then they shuffled towards each other with a quick pace, keeping still upon their fore-knees, and when they were

* "General Carnac, in some observations which he favoured me with upon this subject, says, 'All of the deer kind have the sense of smelling very exquisite. I have frequently observed of tame deer, to whom bread is often given, and which they are in general fond of, that if you present them a piece that has been bitten, they will not touch it. I have made the same observation of a remarkable fine she-goat, which accompanied me most of my campaigns in India, and supplied me with milk, and which, in gratitude for her services, I brought from abroad with me.'"

come within some yards, they made a spring, and darted against each other.

"All the time that two of them were in my stable, I observed this particularity, *viz.* that whenever any attempt was made upon them, they immediately fell down upon their fore-knees; and sometimes they would do so when I came before them; but, as they never darted, I so little thought this posture meant hostility, that I rather supposed it expressive of a timid or obsequious humility *.

"*Female.* The female differs so much from the male, that we should scarcely suppose them to be the same species. She is much smaller, both in height and thickness. In her shape, and in her yellowish colour, she very much resembles deer, and has no horns. She has four nipples, and is supposed to go nine months with young. She commonly has one at a birth, and sometimes twins.

* "The intrepidity and force with which they dart against any object, may be conceived from the following anecdote of the finest and largest of those animals that has ever been seen in England. The violence which he did to himself, was supposed to occasion his death, which happened soon after. A poor labouring man, without knowing that the animal was near him, and therefore neither meaning to offend nor suspecting the danger, came up near to the outside of the pales of the inclosure; the nyl-ghau, with the quickness of lightning, darted against the wood work, with such violence, that he broke it to pieces; and broke off one of his horns close to the root. From this piece of history and farther inquiry, I was satisfied that the animal is vicious and fierce in the rutting season, however gentle and tame at other times."

"The young male nyl-ghau is like the female in colour, and therefore like a fawn.

"*Species.* When a new animal is presented to us, it will often be difficult, and sometimes impossible, to determine its species, by the external characters alone. But when such an animal is dissected by an anatomist, who is a master in comparative anatomy, the question is commonly to be decided with certainty.

"From the external marks alone, I suspected, or rather believed, the nyl-ghau to be a peculiar and distinct species. Some of my acquaintance thought it a deer. The permanent horns convinced me that it was not. It had so much of the shape of deer, especially the female, that I could not suppose it to be of the same species with our black cattle. In rutting time, one of the males was put into a paddock with a female of the red deer: but nothing like attraction or attention was observed between them. At length, in consequence of the death of one of them, I was assured by my brother, who dissected it, and who has dissected with great attention almost every known quadruped, that the nyl-ghau is a new species*.

"*History.* Of late years several of this species, both male and female, have been brought to

* "Mr. Pennant, whose love of natural history heightens the enjoyment of an independent fortune, in his Synopsis, published since this paper was written, classes this animal (white-footed, p. 29) as a species of antelope; but he now thinks it belongs to another genus, and will class it accordingly in his next edition."

England. The first were sent from Bombay, by governor Cromelen, as a present to lord Clive: they arrived in August, 1767. They were male and female, and continued to breed every year. Afterwards two were brought over, and presented to the queen by Mr. Sullivan. From her majesty's desire to encourage every useful or curious inquiry in natural knowledge, I was permitted to keep these two for some time: which enabled me to describe them, and to get a correct picture made; and, with my brother's assistance, to dissect the dead animal, and preserve the skin and skeleton. Lord Clive has been so kind as to give me every help that he could furnish me with, in making out their history; so has general Carnac, and some other gentlemen.

"At all the places in India, where we have settlements, they are rarities, brought from the distant interior parts of the country, as presents to nabobs and great men. Lord Clive, general Carnac, Mr. Walsh, Mr. Watts, and many other gentlemen, who have seen much of India, tell me they never saw them wild. So far as I have yet found, Bernier is the only author who has even mentioned them *. In the fourth volume of his Memoires, he gives an account of a journey

* "Since the reading of this paper, I have received the following information from Dr. Maty. In the fourth volume of Valentyn's Description of the East Indies, published in low Dutch, 1727, under the article of Batavia, p. 231, I find, amongst the uncommon animals kept at the castle, this short indication: 'There was a beast, of the size and colour of the Danish ox, but less heavy, pointed towards the mouth, ash-

which he undertook, ann. 1664, from Delhi to the province of Cachemire, with the mogul Aurengzel, who went to that terrestrial paradise, as it is esteemed by the Indians, to avoid the heat of the summer. In giving an account of the hunting, which was the emperor's amusement in his journey, he describes, among others, that of the nyl-ghau; but, without saying more of the animal, than that the emperor sometimes kills them in such numbers, as to distribute quarters of them to all his omrachs; which shows that they were there wild, and in plenty, and esteemed good and delicious food.

"This agrees with the rarity of these animals at Bengal, Madras, and Bombay: for Cachemire is the most northern province of the empire; and it was on the march from Delhi to that place, that Bernier saw the emperor hunt.

"*Name.* The word nyl-ghau, for these are the component letters corresponding to the Persian, though pronounced as if it were written *neel-gaw*, signifies a *blue cow*, or rather a *bull*, *gaw* being masculine; and the male animal of that name has a good title to that appellation, as well from the likeness he bears in some parts to that species of cattle, as from the bluish tint which is very discernible in the colour of his body; but this is by no means the case with the female, which has a near resemblance, as well in colour as in form, to our red deer. The nyl-

grey, and not less than an elk, whose name he bore.' It was a present from the mogul."

ghaus which have been brought to England have been most, if not all, of them received from Surat or Bombay; and they seem to be less uncommon in that part of India, than in Bengal; which gives room for a conjecture that they may be indigenous perhaps in the province of Guzarat, one of the most western and most considerable of the Hindustan empire, lying to the northward of Surat, and stretching away to the Indian Ocean.

"A gentleman* who has been long in India, and has an extensive acquaintance there, has written to his friends to collect all the intelligence they can possibly procure concerning this animal; and, in the course of the next year, some satisfactory information may be received from thence, though the natives of that country, he says, have no turn whatever after natural history, and indeed are very little inquisitive after any kind of knowledge."

We find, on comparing the engraving of this animal, in the Philosophical Transactions, with the drawings which we have made after Nature in the park of la Muette, near Paris, that, in the English plate, the ears are shorter, the horns rather more blunt, the hair under the neck shorter, stiffer, and not tufted. In this same engraving we do not see the tuft of hair on the hind-feet of the male; lastly, the mane on the withers appears also shorter than in our figures;

* "General Carnac, who likewise favoured me with the preceding article upon the name of the animal."

but these little differences do not prevent it from being the same animal.

Mr. Forster writes me (on the subject of nilgaut) that, notwithstanding Dr. Hunter, in his description, has said that it is of a new genus, it appears to belong to the class of antelopes; and that its manners and shape, compared with some of the great species of antelopes, seem to prove that it ought not to be separated from them. He adds, that the animal described by Dr. Parsons, is certainly the same as the nilgaut; but he believes that Dr. Parsons has not sufficiently noticed the feet, for they are generally marked with white in all those which have been seen since. He says, with Dr. Hunter, that these animals have brought forth in England, and that he was even assured of an instance of a female which produced two young at a time.

THE COUDOUS, OR INDIAN ANTELOPE*.

THE class of ruminating quadrupeds is the most numerous, and the most diversified. It comprehends, as we have seen, a great number

* CHARACTER SPECIFICUS.

Antelope Oreas. A cornibus subulatis rectis carinato contortis, corpore griseo. — *Linn. Syst. Nat. Gmel.* i. p. 190. — *Schreb.* v. pl. 261.

Antelope Oryx. — *Pall. Miscell. Zool.* p. 9. — *Spic. Zool.* i. p. 15.

Antelope (Oryx) cornibus rectis ultra medietatem basi spiraliter tortis, corpore griseo. — *Erxleb. Mamm.* p. 275.

Le Coudous. — *Buff. Hist. Nat. par Sonn.* xxxi. p. 196, pl. 15 (Canna).

Indian Antelope. — *Penn. Hist. Quadr.* i. p. 78. — *Shaw's Gen. Zool.* ii. p. 319, pl. 185.

HABITAT

in India et Africa. *W.*

The Indian antelope, with thick straight horns, marked with two prominent spiral ribs near two-thirds of their length, and smooth towards their end: some are above two feet long. Those at the British Museum, with part of the skin adhering, are black. The colour of the hair, on the fragment of the head, is of a reddish brown, bounded on the cheeks by a dusky line beneath, of a pale brown. — *Penn. Synops. Quadr.* p. 26.

of species, and, perhaps, a still greater number of distinct races, or permanent varieties. Notwithstanding all our researches, and the laborious details into which we have been obliged to enter, we freely acknowledge that the subject is by no means exhausted, and that there still remain animals of considerable note which we know only by imperfect fragments, and are unable to ascertain the creatures to which they belong. For example, in the very large collection of horns preserved in the royal cabinet, as well as in private museums, each of which, after much labour and investigation, we have referred to the animal to whom it belongs, except one, which, having neither ticket nor any other artificial mark of information, is absolutely unknown. This horn is very large, almost straight, and composed of a thick black substance. It is not solid, like that of the stag; but it is a hollow horn, filled with a bone or core, like the horns of oxen. A thick rib, raised about an inch, runs from the base to above the middle of the horn. Though the horn be straight, this prominent rib makes a spiral turn and a half in the inferior part, and is entirely effaced in the superior part, which terminates in a point. Upon the whole, this horn seems to have a greater relation to those of the buffalo than to any other. But we are ignorant of the name of the animal; and it was not till lately, that, in searching different cabinets, we found, in that of M. Dupleix, a fragment of a head

with two similar horns, to which the following ticket was fixed: *Horns of an animal somewhat like a horse, of a grayish colour, with a mane on the fore part of the head like a horse. It is called here (at Pondicherry) coesdoes, which should be pronounced* coudous. This small discovery gave us great joy. We could not, however, find the name *coesdoes* or coudous, in the writings of any traveller. We learned from the ticket alone, that this animal is very large, and that he is a native of the warmest countries of Asia. The buffalo belongs to the same climate, and has also a mane on the top of his head. His horns, it is true, are crooked and flat, while those under consideration are round and straight, which, as well as the colour, sufficiently distinguishes these two animals; for the skin and the hair of the buffalo are black, and, according to the ticket, the hair of the coudous is grayish. These relations suggested others: the travellers into Asia mention large buffaloes of Bengal, reddish buffaloes, and grayish buffaloes of the Mogul empire *, called *nilgauts*. The coudous is perhaps one or other of these animals. From the travellers into Africa, where the buffaloes are as common as in Asia, we have more pointed information with regard to a species of buffalo called *pacasse* in Congo, which seems to be the coudous: "Upon the route from Louanda to

* In the hunting of the nilgauts, or gray oxen, which, in my opinion, are a species of elk, there is nothing particular, &c.—*Voyage de Bernier*, tom. ii. p. 245.

the kingdom of Congo, we perceived * two pacasses, which are animals resembling buffaloes, and roar like lions. The male and female go always in company. They are white, with red and black spots. Their ears are half an ell long, and their *horns are entirely straight.* When they see any person, they neither fly nor do any harm, but stare at the passengers." We formerly remarked that the animal called *empacassa* or *pacassa,* in Congo †, appeared to be the buffalo. It is in fact a species of buffalo, differing from him only in the figure of the horns and colour of the hair. In a word, the pacassa is the coudous, which perhaps constitutes a different species from that of the buffalo, and perhaps is only a variety of it ‡.

* Relation de Congo par les P. P. Michel-Ange de Galline et Denys de Charly de Plaisance, Capucins, p. 77.

† The country of Congo produces another animal which the natives call *empacassa.* Some people think it is the buffalo, and others that it has only a great resemblance to that animal. The editor of Lopes's account tells us, that it is not so large as a buffalo, but that it resembles him in the head and neck. Dapper assures us, that the buffalo is called *empacassa* in the kingdom of Congo, and that its hair is red, and its horns black. — *Hist. Gen. des Voyage,* tom. v. p. 81.

‡ The coudous is the elan of Sparrman. It is about five feet high, and of a bluish ash colour, with a black mane; the tail is tipped with long black hairs: both sexes have horns about two feet long, of which the Hottentots make their tobacco pipe. Its flesh is excellent, and the hide is esteemed, next to that of the Cape buffalo, for making of traces, harnesses, &c. The coudous is the same animal as the canna.

W.

THE CANNA*.

AT first, I knew this animal only by its horns, and I was very uncertain, not only with respect to its species and its climate, but also about the name *coudous,* with which these horns were ticketed; but now my doubts are removed, and it is to Mr. Gordon and M. Allamand that I am indebted for the knowledge of this animal, one of the largest of southern Africa. In the Hottentots' country it is called canna; and the following are the observations which these learned naturalists have published this year, 1781, in a Supplement to the Dutch edition of my works.

" M. de Buffon has been puzzled to determine the animal to which a horn, found in the king's cabinet without a ticket, belonged, and which he has figured in plate 46, of the twelfth volume of his Natural History. Two similar horns, found in the cabinet of M. Dupleix, which were ticketed, have partly relieved his embarrassment. The ticket was thus inscribed: *Horns of an animal somewhat like a horse, of a grayish colour, with a mane on the fore part of the head, like a horse. It is called here (at Pondicherry) toesdoes, which should be pronounced* coudous.

* For the specific character, see the preceding article.

Warner Sc.

CANNA.

"This description, short as it is, is however very just, but not sufficient for M. de Buffon to discover the animal which it described. He had recourse to conjectures, and supposed, with great probability, that the coudous might be a sort of buffalo, or, rather, nilgaut; in truth, the horns of this last animal have most analogy with those in question, and what is said on the ticket is enough, as may be observed by the description which I have given. However, this horn belongs to another animal, which M. de Buffon was not aware of, because it has not as yet been described, or, at least, so imperfectly, that it was impossible to form any just idea. It was reserved for Mr. Gordon to bring us acquainted with it; to whom we owe the figure, and the following particulars.

"Kolbe is the only one who has spoken of it under the name of elk, with which it does not agree, since it differs essentially in its horns, which are not at all like those of the true elk*. I have preserved the Hottentot name of *canna*. The Cafres call it *inpoof*; it is one of the largest cloven-footed animals of southern Africa. The length of that here represented, from the end of the muzzle to the origin of the tail, was eight feet two inches; the height, five feet, measured from the remarkable eminence on the back, above the shoulders: its circumference, behind the fore-legs, was six feet seven inches, and five feet nine inches before the hind-legs:

* See the figure of the horns of the elk, in tom. xxv. pl. 4, of l'Histoire Naturelle, par Sonnini.

but it must be observed that it was very thin: when in its usual good condition, it should weigh about seven or eight hundred pounds: its body was of a fawn colour, tending to the red, and it was whitish under the belly: its head and tail were cinereous; and some of these animals have the whole body of the same colour: all have hairs on the fore part of the head, which form a sort of mane.

"So far this description agrees very well with the coudous; and the horns of the canna are exactly like those which M. de Buffon has described: thus we cannot doubt, that the coudous of Pondicherry, is our canna; but I am surprised, with M. de Buffon, that they have given it the name of coudous, which has never been used by any traveller in the Indies. I suppose it was borrowed from the Dutch, who really write it *coedous*, or *coesdous*, and which they pronounce coudous. They have given it to the animal that M. de Buffon has named *condoma*, and which, in its size, rather approaches the canna. Might not the horns which were found in the cabinet of M. Dupleix, have been carried from the Cape of Good Hope to Pondicherry? Those described in the ticket, following the Dutch orthography, could not be mistaken, except by the name. What authorizes this supposition, is the silence of travellers on an animal so remarkable for its size as the canna. If it inhabited a country so much frequented by Europeans as the Indies, it is very probable that some one would have mentioned it."

I am here, as elsewhere, quite of M. Allamand's opinion; and I own that the Dutch name of *coesdoes*, or *coudous*, ought to remain with the animal which I have called *condoma*; and that the name *coudous* was improperly written on the horns, which we acknowledge to belong to the canna.

"These horns," says M. Allamand, "were such as M. de Buffon has described: they had a thick ridge, forming two turns of a spiral towards their base; they were smooth, straight, and black, for the rest of their length: they were separated two inches from each other at the base, and there was an interval of a foot between their points: their length was eighteen inches, but it varied in different individuals; those of the females were generally thinner, straighter, and longer: they were hollow, and supported by a bone, which served them for a nucleus; so that they never fell off. On this particular Mr. Gordon informs me, that he does not know any animal in southern Africa that sheds its horns; consequently there are neither elks, stags, nor roe-deer. Kolbe is the only person who has seen them.

"The canna has a very remarkable dewlap, which hangs to the fore part of the breast, and which is of the same colour as the head and neck: the females have this part smaller; they are also rather less than the males; they have less hair on the forehead, and it is almost on this alone that their figures differ.

"I have already said, that Kolbe gives to the canna the name of elk; and it is really under

this name, though very improper, by which it is known at the Cape. However, like our northern elk, it has a wen or knob under the throat, about an inch high, as may be seen in the figure. If we may credit Linnæus, it is a distinctive, which he defines; *alces, cervus cornibus a caulibus palmatis, caruncůli gutturala.* But M. de Buffon justly remarks, that the female elks have not this knob, and that, consequently, it is not a character essential to the species. I do not know if it be found in the female canna.

"Its tail, which is two feet three inches long, is terminated by a tuft of long black hairs: the hoofs are also black, and the people (on the strength of the name) attribute to them the same sovereign virtue against convulsions, as to our elks.

"It has four teats and a gall-bladder. Although its head, which is seventeen inches long, resembles that of the stag, it has no sinuses.

"The cannas are almost all destroyed in the neighbourhood of the Cape, but we need not go far to meet with them. They are found in the mountains of the Hottentot Hollanders. These animals go in herds of fifty or sixty, sometimes we have seen even two or three hundred together, near the springs: it is rare to see two males in a herd of females, because then they fight, and the weakest retires: thus the two sexes are often apart. The largest generally walk before: it is a fine sight, to see them trot or gallop in herds: if a loaded gun be fired among them,

heavy as they are, they will leap very high and far, and climb up very steep places, where it appears impossible to reach them. When hunted, they always run against the wind, and, with a good horse, it is easy to overtake them. They are very gentle, so that we may go into the middle of a herd and take our choice of them without running the slightest risk. Their flesh is excellent venison: their bones are broken for the sake of the marrow, which is roasted under the ashes; it is well tasted, and may be eaten without bread: their skin is very firm, and serves for girdles and straps. The hairs on the head of the males smell very strongly of urine, which it is said they contract by licking the females. These have never more than one young at a time.

"As these animals are not mischievous, Mr. Gordon thinks that they might easily be domesticated, made to draw a cart, and employed as beasts of burden; which would be a very important acquisition to the colony of the Cape.

"M. Pallas saw, in the cabinet of the prince of Orange, a skeleton of a canna, which he recognised to be the elk of Kolbe. He ranks it in the class of antelopes, under the name of *antilope oryx*. I do not examine his reasons for giving it this last epithet; I content myself with remarking, that it appears doubtful to me if the canna be found in the northern parts of Africa, at least no traveller has said so. It is peculiar to the southern countries of this part of the world: it does not appear to be the oryx of the ancients;

besides, according to the testimony of Pliny, the oryx was a wild goat, and it is not probable that Pliny, who was not forming a system of nomenclature, like our modern authors, has given the name of goat to so large an animal as the canna."

Before I received these very judicious remarks from M. Allamand, I had made nearly the same reflections, and the following is what I had written, and even delivered to be printed.

M. Pallas calls this animal *oryx*, and has placed it among the antelopes; but the name appears to me to be ill applied: I would nevertheless adopt it, if I could suppose the canna from the Cape of Good Hope was the oryx of the ancients; but that is neither true nor even probable. M. Pallas believes that the African elk, noticed by Kolbe, is the same animal as this, and I am not very far from the same opinion, although I have given an account of the African elk of Kolbe, or bubalus; but whether it belongs in effect to the bubalus, or canna, it is certain that the name elk is very ill applied, since the elk has solid horns, that are shed every year, like those of the stag whereas the animal in question; carries solid and permanent horns, like those of oxen and goats.

And what makes me say that the name of oryx is misapplied to this animal by Pallas, and that it is not the oryx of the ancients, is, that they were only acquainted with a very small part of Asia, and the mere portion of Africa which extends along the Mediterranean. Besides,

this animal, to which M. Pallas gives the name of oryx, is neither found in Asia Minor, in Arabia, in Egypt, nor in all Barbary and Mauritania; so that there is reason to presume that it was neither known nor named by the ancients.

Mr. Forster writes me that he saw a female of this species in 1772, in the menagery of the Cape of Good Hope, which, measured from the fore-legs, was about four feet high. "It had," says he, "a sort of mane along the neck, which extended to the shoulders, where also we saw some very long hairs: it had a black line on the back, and the knees were of the same black colour, as also the nose and the muzzle; the hair on the body was tawny, and nearly resembled that of the stag; but the belly and fore part of the legs were whitish.

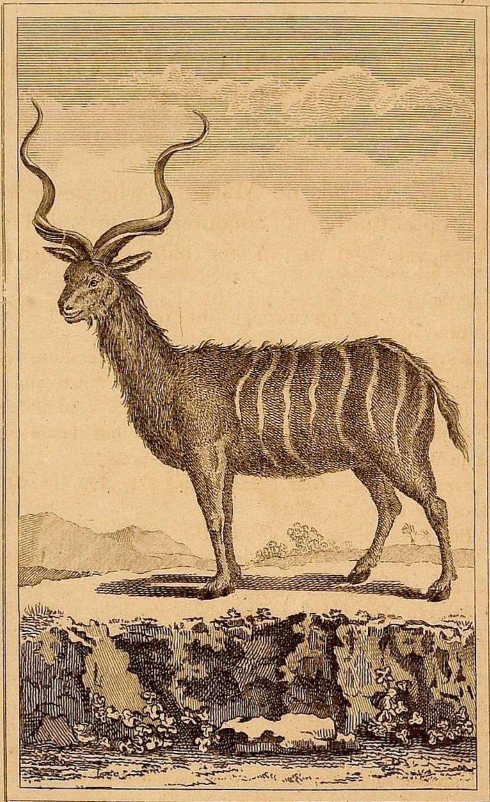
"Under the throat of this female there was an eminence of the size of an apple, which was formed by the bone of the larynx being larger and more apparent in this animal than in any other. Thus the female canna, like the male, has an eminence under the throat, whilst in our species of northern elk, the male alone bears this appendage.

"According to Mr. Forster, all the cutting teeth were of a considerable size, but the middle ones were the largest. The eyes were lively and full of fire: the horns were about eighteen inches long; and, to have an idea of their position, they must be considered as forming a great V, when the animal is seen in front, and as perfectly

hiding each other when they are looked at in a transversal direction: the horns were black, smooth for the most part, with some annular ridges towards the base; we remarked a blunt angle following the contour of the horn, which was straight in its direction, and a little twisted in its shape. The ears were large: the hoofs very small in proportion to the body; their form was triangular, and their colour black.

"Finally, this female was very tame, and freely eat of bread and cabbage leaves; and even took them from the hand: she was in her fourth year; and, as she had no male companion, and was in heat, she mounted the antelopes, and even an ostrich, which was in the same park. We are assured that these animals are found on the high mountains of the interior of the Cape; they spring surprisingly, and leap over walls of eight or ten feet high."

Plate 274



Warner Sc.

CONDOMA.

THE CONDOMA, OR STRIPED ANTELOPE*.

THE marquis de Marigny, who never loses an opportunity of encouraging arts and sciences, showed me in his cabinet the head of

* CHARACTER SPECIFICUS.

Antilope Strepsiceros. A. cornibus spiralibus carinatis subrugosis, corpore strigis transversis et spinali albis. — *Linn. Syst. Nat. Gmel.* i. p. 192. — *Schreb.* v. pl. 267.

Antelope (strepsiceros) cornibus spiralibus, fascie nigricante V. albo notata. — *Erxleb. Mamm.* p. 282.

Strepticeros. — *Gesn. Quadr.* p. 295, 322, ic. 31. — *Jonst. Quadr.* p. 54, pl. 24.

Bos Strepticeros. — *Aldrov. Bis.* p. 363.

Le Condoma. — *Buff. Hist. Nat. par Sonn.* xxxi. p. 132, pl. 16.

Striped Antelope. — *Penn. Hist. Quadr.* i. p. 88, pl. 14. — *Shaw's Gen. Zool.* ii. p. 334.

HABITAT

ad Caput Bonæ Spei. *W.*

The striped antelope has smooth horns, twisted spirally, compressed sideways, with a ridge on one side following the wreaths; they consist of three bends, are three feet nine inches long, and of a pale brown colour; they are close at the base, and two feet seven inches and a half distant at the points, which are round and sharp. In the upper jaw, there is a

an animal, which, at first sight, I took to be that of a large bubalus. It resembles the head of our largest stags. But, instead of solid horns, like those of the stag, it had two large hollow horns, with a ridge like those of the he-goat, and a double flexion, like those of the antelopes. In searching the royal cabinet, I found two horns which belonged to this animal. The first had been brought from the king's wardrobe, without any title or name. The second I had from M. Baurhis, commissary of the navy, under the name of the *condoma* of the Cape of Good Hope; which name we have adopted, because the animal has not hitherto been described or denominated.

From the length, thickness, and especially the double flexion of the horns, the condoma makes a near approach to the *strepsiceros* * of Caius.

hard, horny substance, disposed in ridges. The length of the animal is nine feet, and the height four. The body is long and slender; the legs are slender; the face is brown, and marked with two white lines proceeding from the corner of each eye, and uniting above the nose. The colour in general is of a reddish cast, mixed with gray. From the tail, along the top of the back to the shoulders, there is a white stripe; from this are seven others, four pointing towards the thighs, and three towards the belly. On the upper part of the neck is a short mane. Beneath the neck, from the throat to the breast, are some long hairs hanging down. The breast and belly are gray. The tail is two feet long, brown above, white beneath, and black at the end.—*Pennant's Synops. of Quad.* p. 31.

* Strepsicerotis cornua tam graphice descripsit Plinius, atque lyris tam apposite comparavit, ut longiore verborum ambitu opus non sit. Ergo hoc tantum addam; ea esse intus

The figure, and even all the dimensions of the horns, are almost perfectly the same. From this correspondence in the size and figure of the head and horns, we may presume that the condoma and *strepsiceros* of Caius are the same animal, especially when the following reflections are attended to: 1. Caius, it is obvious, was deceived, when he made this animal the *strepsiceros* of the ancients: for the *strepsiceros* of the ancients is unquestionably the *antelope*, whose head is very different from that of the stag. Now Caius tells us, that the head of the strepsiceros resembled that of the stag: and, therefore, it could not be the strepsiceros of the ancients. 2. Caius's animal, like the condoma, had thick horns, above three feet long, covered with rugosities, instead of rings or tubercles; but the horns of the

cava, sed longa pedes Romanos duos palmos tres, si recto ductu metiaris: si flexo, pro natura cornuum, pedes tres integros. Crassa sunt, ubi capiti committuntur, digitos Romanos tres cum semisse. Describuntur in ambitu palmis Romanis duobus et dimidio, eo ipso in loco. In summo, livore quodam nigrescunt, cum in imo fusca magis et rugosa sint. Jam inde a primo ortu sensim gracilescunt, et tandem in acutum exeunt. Pendent, una cum facie sicca per longitudinem dimidiata, libras septem uncias tres et semissem. Facies, quæ adhuc superest juncta cornibus, et frontis cervicisque pilus, loquuntur *strepsicerotem* animal esse magnitudine fere cervina, et pilo rufo adinstar cervini. Sed an nare et figura corporis cervina sit, ex facie nihil habeo certi dicere, cum nares diuturni temporis usu detritæ sint, et facies eadem de causa hinc inde glabra sit; conjiceres tamen ex eo quod superest eum propius accedere ad cervum aut platycerotem.—*Caius, apud Gesnerum, de Quad.* p. 295.

strepsiceros of the ancients, or *antelope*, are much thinner and shorter, having both rings and tubercles. 3. Though the horns of the condoma in the cabinet of the Marquis de Marigny, as well as those which were brought from the king's wardrobe, had been polished by friction, it is easy to perceive that they never had rings. This fact is farther demonstrated by the horn sent to me by M. Baurhis, which had never been touched, and yet it had only rugosities like the he-goat, and no rings like the *antelope*. Now Caius himself tells us, that the horns of his strepsiceros had rugosities only. Hence this strepsiceros is not that of the ancients, but the animal we are here treating of, which possesses all the characters which Caius attributes to his.

In examining the writings of travellers, we have found nothing that approaches so near to the genuine idea of this animal, which is so remarkable for its size, and particularly the largeness of its horns, as the quadruped mentioned by Kolbe under the denomination of the *wild goat* of the Cape of Good Hope. "This goat," says he, "which has received no name from the Hottentots, and which I have called the *wild goat*, is remarkable in many respects. It is of the size of a large stag; its head is very beautiful, and adorned with two smooth horns, which are bended and pointed. They are three feet in length, and their extremities are two feet asunder." These characters seem to correspond exactly with the animal under con-

sideration: but, having seen the head only, we cannot be equally certain that the rest of Kolbe's description * will apply to it with equal precision. Future observations alone can determine the truth of what now appears to be extremely probable.

At the time I published this article, I had not seen the entire skin of the condoma, which they call *coesdoes* at the Cape of Good Hope; I had then only given the figure of the head and horns †, and from thence arose the mistake about the word *coesdoes*, or *coudous*, rectified in the article canna: but we have since received a well preserved skin of this animal, from which we have engraved our figure. . . . .

. . . .

The Forsters, who saw this animal alive, have communicated to me the following observations. "The condoma, or coesdoes, is four feet high, measured from the fore-legs, and the horns are three feet nine inches long; their ends are two feet seven inches apart; they are gray, but whitish at the tip; their ridge follows all their

* From the front and along the whole back, as far as the tail, there is a white stripe; another, of the same colour, surrounds the lower part of the neck; other two, of the same kind, surround the body, the one behind the fore-legs, and the other before the hind-legs. The hair on the rest of the body is gray, with some reddish spots, except that on the belly, which is white. The beard is gray and very long. The limbs, though long, are well proportioned. — *Descript. du Cap de Bonne Esperance, par Kolbe,* tom. iii. p. 42.

† This plate, being useless, is omitted.

W.

inflections, or curvatures, and they are rather compressed and twisted spirally. The female is horned like the male. The ears are large, and the tail, which is only six inches long, is brown at its origin, white in the middle, and black and tufted at the end.

"The skin is commonly gray, and sometimes reddish: there is a white line on the back, extending to the tail; from this line descends seven bars of the same white colour, four on the thighs, and three on the flanks. In some specimens these bars are eight, or even nine in number; in others there are only six, but those with seven are the most common. On the ridge of the neck, there is a sort of mane, formed of long hairs: the forehead is blackish, and a white line goes from the anterior corner of each eye, which extends to the muzzle. The belly and feet are of a whitish gray: there are sinuses under the eyes.

"These animals are found in the interior of the Cape of Good Hope. They do not go in herds, like certain species of antelopes. They bound and leap surprisingly; we have seen them clear a fence ten feet high, although they had but a very confined space to take their spring. They may be tamed, and fed with bread: we have seen several at the menagery of the Cape of Good Hope."

To these observations, we shall also add the excellent description of this animal which M. Allamand published at the end of the fourth volume of my supplements to the Natural

History (Dutch edition); he has there added a very fine figure of a much larger specimen than that which I have drawn and engraved.

"Although the horns of the animal, to which M. de Buffon has given the name of *condoma*, are sufficiently known, and very often found in the cabinets of natural curiosities, yet the animal has never been described; it is, however, remarkable enough, to deserve the attention of travellers and naturalists.

"M. de Buffon is right in saying that it nearly approaches the animal which Caius has given under the name of *strepsiceros*, since it can hardly be doubted that it is not the same, considering the perfect conformity of the horns*. He also supposes that it may be the animal to which Kolbe has given the name of wild goat;

* "M. de Buffon observes, that Caius is mistaken in giving the name of *strepsiceros* to this animal, which means only the antelope, from which the condoma greatly differs. The late translator of Pliny says, that M. de Buffon is completely mistaken in the distinctive character of the horns of the *strepsiceros*, to which he does not allow the double flexion attributed to them by M. de Buffon: he asserts that they are straight, but spirally channelled, and depends on this passage of Pliny: *Erecta autem (cornua) rugarumque ambitu contorta et in leve fastigium exacuta, ut liras diceres, strepsiceroti, quam addacem Africa appellat.* Which may be thus translated: 'The chevreuil strepsiceros of the Greeks, called addax in Africa, with straight horns terminating in points, but twisted spirally, and channelled round about.' If he had observed that, in his translation, he has omitted the words *ut liras diceres*, which belong only to the figure of the horns of the antelope, he doubtless would not have made this critique."

and really his description has some analogy to that which I shall give of the condoma; but still there are notable distinctions, as will soon be perceived.

"M. Pallas, who in his Spicilegia Zoologica, fasc i. p. 17, has given a good description of the head and horns of the condoma, thinks that M. de Buffon is deceived in taking this animal for the wild goat, because it has no beard. If he has no other reason than that to support his opinion, it is he who is mistaking, for the condoma has a very remarkable beard.

"But without stopping to examine the conjectures which may be formed about the figure of this animal, we have preserved M. de Buffon's name of condoma, although it differs from that given it at the Cape, where they call it *coesdous*, or *coudous*. We have had the pleasure to see one here alive, which was sent from the Cape of Good Hope, in 1776, to the menagery of the prince of Orange.

"I often went to see it: struck with its beauty, I could not cease to admire it, and, from day to day, deferred making an exact description. When I intended to return to examine it more strictly, I was mortified to find that it was dead; and thus all that I intended to say, was confined to what my memory would suggest. Fortunately, before it was taken to the prince's menagery, it passed through Amsterdam: there M. Schneider made a drawing of it. . . . . . . and Dr. Klockner, who omits no opportunity to increase his knowledge of natural history, examined it with the eyes of a true

observer, and drew up a description, which he had the goodness to communicate to me; so that it is to him I owe the principal details which follow.

We are struck with the first sight of this animal. The lightness of its walk, the fineness of its limbs, the short hair with which the greatest part of its body is covered, the lofty manner in which it carries its head, the grandeur of its size, all bespeak a very fine stag; but the large and singular horns, with which it is adorned, the white spots under the eyes, and the stripes of the same colour seen on the body, and which have some analogy to those of the zebra, soon enable us to distinguish it, but in such a manner, however, as to tempt us to give it the preference. The head of the condoma is like that of the stag: it is covered with brown hairs, with a little circle of reddish colour round the eyes; from the lower edge of each, there proceeds a white line, which advances obliquely, and, spreading on the sides of the muzzle, terminates in a point: on both sides of these lines we see three round spots of a pale white, of which the two superior are as large as a twenty-sous piece, and the lower one, near the muzzle, rather smaller. The eyes are black, large, and full of vivacity: the end of the muzzle is black and bare: the lips are covered with white hairs, and the lower jaw is provided with a grayish beard, five or six inches long, and ending in a point: it has two horns of a brown colour, tending to black, and covered with rugosities; they are ridged their whole length, except towards the tip, which is round, and ends in a

blackish point; they have a double bend, like those of antelopes, and are precisely such as Messrs. Buffon and Daubenton have described. Their perpendicular length, in the animal which I describe, was not more than two feet an inch and eight lines, which leads me to believe that it was not full grown, for we find horns that are longer: I have deposited two pair in the collection of our academy, of which, the shortest are two feet five inches in a straight line, and three feet and a half following the curvature; they are nine inches in circumference at the base, and two feet and a half distant between the points.

"The ears are long, large, and of the same colour as the body, which is covered with very short hairs of a rufous gray: there is a kind of mane upon the neck, composed of long brown hairs, that extend from the top of the head to the shoulders; there they become shorter, and change colour, forming a white stripe, which runs along the back to the tail. The rest of the neck is covered with similar long brown hairs, particularly just beneath the breast. Other white stripes, about an inch broad, proceed from the white line on the back, and descend along the sides: these rays are nine in number, and the first is behind the fore-legs; four go down to the belly; the third is the shortest; the four last are on the rump, as shown in the figure.

"The tail is above a foot long; it is rather flat, and bordered with whitish-gray hairs, which form a tuft at the end, of a blackish brown. The legs are delicate, but nervous, without that tuft of

hair, or brush, which is found on the hind-legs of the stag: the hoof is black and cloven, like all the animals of this class.

"This is the description of the condoma in the menagery of the prince of Orange; however, we must not suppose that all the condomas are marked precisely alike. Dr. Klockner saw several skins where the white stripes differed in length and position; but such difference is understood to be only a variety, deserving some attention. There is a thing of more consequence to be noticed here: it is, that the majority of the skins have no beard; and one is to be seen in the collection of the Society of Harlem, which is very well prepared to exhibit the true figure of the animal, but also without a beard. May there then be bearded condomas, and others without a beard? It is what I can hardly believe, and I think, with Dr. Klockner, that the beard has fallen from these skins during the preparation; and the more so, because, if they are examined with attention, we observe the place where the hairs which composed the beard appear to have been.

"Our condoma was very gentle, he lived quietly with the animals that grazed with him in the same park; and, whenever he saw any one approaching the pales, he ran to take the bread which was offered him: he was fed with rice, oats, grass, hay, carrots, &c. In his native country, he ate grass, and browsed the buds and leaves of young trees, like stags and goats.

"Though I saw him very often, I never heard his voice; but Dr. Klockner says, that it is somewhat like that of an ass.

"By comparing this description of the condoma with Kolbe's account of the wild goat of the Cape of Good Hope, which M. de Buffon has inserted in his natural history of the condoma, we have the confirmation of what I have said before, that the condoma, in some respects, resembles that goat: it is of the same size; its hair is nearly of the same gray colour, and, like her, it has a beard, and stripes descending on the sides. This is enough to authorize M. de Buffon in saying, that he has found no account of an animal which came nearer the condoma than the wild goat of Kolbe; but I have also observed, that there are remarkable differences between the two animals. The number of stripes on their sides is not the same, and they are differently situated. The goat does not appear to have the white spots which are below the eyes of the condoma, and which are too striking for us to suppose that Kolbe has forgotten to mention them; but what chiefly distinguishes these animals is the horns; those of the goat are said to be simply recurved, which does not express the double bend so remarkable in those of the condoma: also, in the figure that Kolbe has added to his description, the goat is represented with horns that would be quite straight, were it not for a slight curvature above, which is hardly perceptible.

"The author of a Natural History, published in Holland, has given the figure of an animal killed on the eastern coasts of Africa, a drawing of which was sent to him by a physician *. To judge by the horns, this animal is a true condoma; but, if it be well figured, it has too heavy a body, and none of the stripes and white spots found on that which we have described. M. Muller has given a tolerable representation of the condoma in a coloured plate."

* See Natuurlyke Historie, &c., Eerste Deel, derde stak. p. 267, pl. 26.

THE GUIB, OR HARNESSED ANTELOPE*.

THIS animal, though not taken notice of by any naturalist or traveller, is very common in

* CHARACTER SPECIFICUS.

ANTILOPE SCRIPTA. A. cornibus subulatis rectis contortis, corporis strigis albis decussatis.—*Linn. Syst. Nat. Gmel.* i. p. 191.—*Schreb.* v. pl. 258.

Antilope (Scripta) cornibus rectis spiraliter tortis, corpore rufo-fusco striis albis.—*Erxleb. Mamm.* p. 276.

ANTILOPE SCRIPTA.—*Pallas, Miscell.* p. 8.—*Spicil.* i. p. 15.

LE GUIB.—*Buff. Hist. Nat. par Sonn.* xxxi. p. 165, pl. 18.

HARNESSED ANTELOPE.—*Penn. Hist. Quadr.* i. p. 81.—*Shaw's Gen. Zool.* ii. p. 322, pl. 186.

HABITAT

gregaria in campestribus et sylvis, fluvio Senegal adjacentibus. *W.*

The harnessed antelope has straight horns, nine inches long, pointing backward, with two spiral ribs. The ears are broad. The colour is a deep tawny. Beneath each eye there is a white spot. The sides are most singularly marked with two transverse bands of white, crossed by two others from the back to the belly; the rump with three white lines pointing downward on each side. The thighs are spotted with white. The tail is ten inches long, covered with long rough hairs.——*Penn. Synops. Quadr.* p. 27.

Plate 275

A. Bell Sculp.t

GUIB.

Senegal, from whence M. Adanson brought a skin, and presented it to the royal cabinet. It resembles the gazelles, and particularly the nanguer, in the size and figure of the body, in the lightness of the limbs, in the form of the head and muzzle, in the eyes and ears, and in the length of the tail, and the want of a beard. But all the gazelles, and especially the nanguers, have their bellies of a fine white colour; while the breast and belly of the guib are of a deep chesnut. It differs likewise from the gazelles by its horns, which are smooth, without transverse rings, and have two longitudinal ribs, the one above and the other below, forming a spiral twist from the base to the point; they are also somewhat compressed. These characters make the guib approach the goat more than the gazelle. It is, however, neither the one nor the other, but an intermediate species. This animal is remarkable for white bands upon a chesnut ground colour. These bands are disposed along and cross the body, like a harness. He lives in society, and great flocks of them are found in the plains and woods of the country of Podor. As M. Adanson is the first who remarked the guib, we shall subjoin his description, which he obligingly communicated to us *.

* Guib, *among the Negroes, Oualofes* or *Jalofes.* Gazella cornibus rectis spiralibus; caput, rostrum, nasus, oculi, uti *Nanguer.* Cornua recta spiralia, spira prima nigra, nitida, subcompressa, angulis duobus lateralibus, antice convexa, pone plana, apice conico teretia. . . . Aures uti *Nanguer* intus sub-

nudæ quinque pollices longæ. . . . . Cauda decem pollices longa, pilis longis hirta. Dentes duo et triginta. Pedes uti *Nanguer*. Corpus totum fere fulvum. Albæ fasciæ sex utrinque in dorso transversæ, et fasciæ albæ duæ longitudinales ventri laterales. Maculæ albæ utrinque octo ad decem supra femora, orbiculatæ. Collum subtus album et genæ albæ; latera pedum interiora alba, macula alba paulo infra oculos. Frons media nigra, linea supra dorsum longitudinalis nigra, venter subtus niger, pars antica pedum anteriorum, ungulæ, et cornua nigra; longitudo ab apice rostri ad anum quatuor pedes cum dimidio; altitudo a pedibus posticis ad dorsum duos pedes octo pollices; pili omnes brevissimi, lucidi, vix unum pollicem longi, corpori adpressi. Pulchrum animal a *D. Andriot* missum.—*M. S. communicated by M. Adanson to the Royal Academy of Sciences.*

Plate 276

A. Bell Sculp.t

GRIMM.

THE GRIMM, OR GUINEA ANTELOPE*.

THIS animal is known to the naturalists by the appellation of the *grimm-goat* only, which, as we are ignorant of the name given it in its na-

* CHARACTER SPECIFICUS.

ANTILOPE GRIMMIA. A. cornibus conicis compressis rectissimis rugoso-striatis, hinc detritis, fossa suboculari atra. — *Linn. Syst. Nat. Gmel.* i. p. 191. — *Schreb.* v. pl. 260.

Antilope (Grimmia) cornibus rectis basi subannulatis, inter cornua fasciculo piloso. — *Erxleb. Mamm.* p. 276.

Gragulus (Africanus) in medio capite fasiculum pilosum erectum gerens. — *Briss. Reg. Anim.* p. 97.

Capra Sylvestris Americana. — *Grimm. Miscell. Nat. Curios.* dec. 2. an. 4. p. 131, fig. 13, mala.

Capra Sylvestris Africana. — *Raii. Syn. Quadr.* p. 80.

ANTILOPE GRIMMIA. — *Pall. Miscell.* p. 8, 10, t. 1, 3, 4, fig. 3, a. b. — *Spicil. Zool.* i. p. 38, pl. 3. xii. 1, p. 92.

LA GRIMME. — *Buff. Hist. Nat. par Sonn.* xxxi. p. 152, pl. 17.

GUINEA ANTELOPE. — *Penn. Hist. Quadr.* i. p. 81. — *Shaw's Gen. Zool.* ii. p. 324, pl. 187.

HABITAT

in Guinea. *W.*

The Guinea antelope has straight black horns, slender and sharp pointed, not three inches long, and slightly annulated at the base. The height of this most elegant animal is about

tive country, we shall adopt. There is a figure of it in the German * Ephemerides, which has been copied in the Academy Collection †. Dr. Herman Grimm was the first who mentioned this animal; and what he says concerning it was copied by Mr. Ray, and afterwards by all the nomenclators. Though his description be incomplete ‡, he points out two characters so remarkable, that we easily recognised a head of a Senegal animal, sent us by M. Adanson, to belong to the grimm. The first is an enormous cavity below each eye, which penetrates so deep as to

eighteen inches. The ears are large, and the eyes dusky: below the eyes is a large cavity, into which exudes a strong scented oily liquid. Between the horns is a tuft of black hairs. The colour of the neck and body is brown, mixed with cinereous, and a tinge of yellow. The belly is white. The tail is short, white beneath, and black above.—*Penn. Synops. Quadr.* p. 28.

* Ephem. Nat. Cur. an. xiv. obs. 57.

† Collect. Academ. tom. iii. pl. 26.

‡ In a castle, near the Cape of Good Hope, says Dr. Herman Nicolas Grimm, I saw a very singular species of wild goat. It was of an obscure ash-colour. On the top of its head there was a tuft of erect hairs; and, between each eye and nostrils, a cavity filled with a yellowish humour, which was oily and viscid, and, when exposed to the air, became black and hard: this substance, the odour of which participates both of castor and musk, renews successively after the cavities are emptied. I was assured that the cavities had no communication with the eyes, and that the thick humour they contained was different from that collected in the large angle of the eyes of stags and several other animals.—*Ephem. des Curieux de la Nature,* decad. ii. ann. 4, 1686, obs. 57. *Collection Academique, Dijon,* tom. iii. p. 696, tab. 26.

leave only a thin plate of bone between each cavity and the partition of the nose: the second is a bushy tuft of hair, reflected backward on the top of the head. These characters sufficiently distinguish the grimm from all the other goats or gazelles. It has, however, a resemblance to both, not only in the form of the body, but even in the horns, which are annulated towards the base, furrowed longitudinally, like those of the gazelles, and, at the same time, directed horizontally backward, and very short, like those of the small African goat, formerly mentioned. Besides, this animal being much smaller than the goats, gazelles, &c., and having very short horns, seems to constitute the shade between the goats and the *chevrotains*, or small antelopes.

In the species of the grimm, the males alone appear to have horns; for the individual described and engraved by Dr. Grimm had no horns; and the head given us by M. Adanson had two short horns, nearly concealed among the hair, though still apparent enough to be seen by the drawer: besides, in the history of the *chevrotains*, or small antelopes, we shall find, that, in the royal, or Guinea antelope, the male alone has horns; which makes it probable that the case is the same with the grimm species, which is more allied to the small antelopes than to any other animal.

Messrs. Vosmaër and Pallas have given descriptions of this beautiful animal, and a good figure of it, which we have here copied. It is

worthy of remark, that the horns of the grimm, preserved in the royal cabinet, bend a little forward at their points; while those described by Vosmaër and Pallas bend a little backward. The ears of the former are round at the extremities; but those of the latter terminate in a point. Is this a natural variety, or an error in the drawing? Vosmaër and Pallas's grimm has the point of the nose black, a black band extending from the nose along the chanfrin, and ending at the tuft of hair placed on the top of the front. The head in the royal cabinet has not this band: these slight differences, however, are not sufficient to constitute distinct species.

M. Vosmaër calls this animal the *small beautiful buck* of Guinea, probably on account of its elegance. But I shall retain the name of *grimm*; because, under that appellation, it is known to all the naturalists.

"This animal," M. Vosmaër remarks, "was a male, and one of the most beautiful and delicate creatures I ever saw. It was sent from Guinea to Holland along with thirteen others of the same species, and of both sexes. Twelve of them died during the voyage, and in this number were all the females; so that there remained alive two males only, which were put into the menagery of the prince of Orange, where one of them died in the winter, 1764. According to our information, the females have no horns. These animals are extremely timid. Any noise, and particularly thunder, terrifies them. When

surprised, they express their fear by blowing suddenly and with great force through their nose.

"The one which is still alive (in 1766) was at first wild; but has now become pretty tame. It listens when called by its name *tetje*, and, when gently approached, with a piece of bread in the hand, it allows its head and neck to be stroaked. It is so cleanly, that it suffers not the smallest particle of dirt to remain on any part of its body; for this purpose, it often scratches itself with one of its hind-feet. This is the reason why it has received the appellation of *tetje*, from *tettig*, which signifies *neat*, or *clean*. However, if a person continues for some time to rub its body, a white powder adheres to his fingers, like that which proceeds from horses when they are curried.

"This animal is extremely agile; and, when reposing, it frequently keeps one of its fore-feet in an elevated and bended position, which gives it a very agreeable appearance. It is fed with bread, rye, and carrots: it likewise spontaneously eats potatoes. It is a ruminating animal, and discharges its excrements in small balls, the size of which is considerable, in proportion to the magnitude of the creature."

Dr. Herman Grimm tells us, that the fat, viscid, yellow humour, which is secreted in the cavities above the eyes of this animal, has an odour that participates of musk and castoreum. M. Vosmaër remarks, that, in his live subject, this viscid matter had no odour of any kind;

and that the figure given by Grimm is extremely erroneous; for it represents a tuft of hair on the forehead, which has no existence; and his subject, which was a female, had no horns. "But ours," continues M. Vosmaër, "is a male, and has large horns in proportion to its size: and, instead of this high, erect tuft of hair, it had only a small quantity, which rose a little to a point between the horns. It is about the size of a kid of two months old" (though it was probably three or four years of age; because it was sent from Guinea before the winter, 1764, and M. Vosmaër published his description of it in the year 1767). "Its limbs are fine, and well proportioned to its body. Its head is beautiful, and pretty much resembles that of a roebuck. The eye is lively and full of fire. The nose is black and naked, but always moist. The nostrils are shaped like a long crescent. The edges of the muzzle are black. The upper lip, though not divided, has the appearance of being separated into two lobes. There is no hair on the chin; but, a little higher, there are, on each side, a kind of small whiskers; and, under the throat, a sort of wart garnished with hair" (which brings this animal still nearer to the goat kind, most of whom have similar warts or excrescences on their throats).

"The tongue is rather round, than oblong or pointed. . . . . The horns are black, finely furrowed from top to bottom, and about three inches in length: they are perfectly straight, and

terminate in a very sharp point. At the base, they are nearly three quarters of an inch thick; and they are ornamented with three rings, which rise a little backward.

"The hairs on the front are straighter than the others; and, at the origin of the horns, they are coarse, gray, and crisped. Between the horns, the hair is more erect, and forms a kind of pointed black tuft, from which a stripe of the same colour descends and loses itself in the nose.

"The ears are large, and have, on the outside, three cavities or depressions, directed from the top to bottom. Internally, and at the summit, the ears are garnished with white, short hair: the rest of the ears is naked and black. The eyes are pretty large, and of a deep brown colour. The hair on the eyelids is black, close, and long, especially on the upper eyelid. Above the eyes there are some long hairs; but they are thinly dispersed.

"On both sides, between the eyes and nose, we see those remarkable cavities by which this animal is easily distinguished. These parts are naked and black. In the middle, a cavity or depression appears, which is somewhat callous, and always moist. A small quantity of a viscid gummy humour distils from it, which soon hardens, and becomes black. The animal seems occasionally to throw off this excrementitious matter; for we find it hard and black on the stakes of his lodge, as if it had been wiped off.

With regard to the odour, mentioned by Dr. Grimm and his followers, I could never discover it.

"The under part of the neck, which is moderately long, is covered with pretty coarse hair, of a yellowish-gray colour, like that of the head. But the throat and upper part of the neck is white.

"The hair on the body is black and stiff, though it be soft to the touch. That on the anterior parts is of a fine bright gray colour; farther back it is a bright brown; toward the belly it is gray: and, lower down, it is perfectly white.

"The legs are extremely slender, and blackish near the hoofs. The anterior parts of the fore-feet, as far as the knees, are adorned with a black band. They have no heels; but, in their place, there is a slight excrescence. The feet are cloven, and provided with beautiful, black, pointed, smooth hoofs.

"The tail is very short, white, and marked above with a black band. With regard to the organs of generation, they are firmly inclosed in a black scrotum, hang down between the legs, and are provided with a large prepuce."

M. Allamand has given the same figure of the grimm in his additions to my work, but has added nothing to what Messrs. Pallas and Vosmaër have said.

To the account of this animal, I must add some remarks of the Forsters:

"Dr. Grimm is the first," say they, "who has described this Cape animal; but as he saw the female only, Linnæus thinks that it belonged to the musk goat. M. de Buffon was the first who ranked the grimm with the antelopes, and, after him, M. Pallas, having examined a male of this species in the menagery of the prince of Orange, gave a very exact description of it. . . . . I got a horn at the Cape of Good Hope, which was given me for that of a *plunging goat* (duykerbok); and I understood it was called plunging goat, because it always lived among the bushes, and whenever it perceived a man, it leaped up to watch his motions, after which it replunged into the bushes, and fled, looking up from time to time, to observe if it was pursued. M. Pallas was acquainted with this plunging goat, because he had found it in Kolbe, but he did not know that it was the same animal as the grimm. He calls it in Latin *capra nictitans*. I was likewise informed, that the female, in this species, has no horns, but that, like the male, it has a little tuft of hair on the forehead. The horns are four inches long; they are straight, black, and marked with four or five indistinct rings: they appear to me rather compressed and striated, but not wrinkled, on the posterior surface. The rest, to the point, is smooth: they assured me that this grimm never exceeded the size of a fawn of the fallow deer *."

* M. Daubenton has observed a considerable sinking on the skull of the grimm, which is peculiar to this animal.

This sinking is remarked above the first molar teeth, between the orbits of the eyes and the bone of the nose. It is so large and deep, that the sides of the jaw form only a very thin lamina. The frontal bone is also very different from that of the antelopes: there is a convexity in its middle. The hair of the head is disposed in a tuft. The horns are placed at a considerable distance beyond the orbits, and are directed backwards. *W.*

THE MAZAMES.

MAZAME, in the language of Mexico, was the name of the *stag*, or rather a generic name including the *stag*, the *fallow deer*, and the *roebuck*. Hernandes Recchi, and Fernandes, who furnished us with this appellation, distinguish two species of mazames, both of which are very common in Mexico and New Spain. The first, and the largest, to which they give the simple name of *mazame* *, has horns resembling those of the European roebuck, that is, about six or seven inches long, with the extremities divided into two points, and a single antler. The second, which they call *temamaçame*, is smaller, and its horns are simple, and have no antlers.

* De Mazame seu Cervis, cap. 14. . . . . Hos (*Telethtlalmaçame* scilicet et *Temamaçame*) ego potius computaverim inter Capreos (quam inter Cervos). . . . . Mazames caprarum mediocrium paulove majori constant magnitudine; pilo teguntur cano et qui facile avellatur, fulvoque; sed lateribus et ventre candentibus: . . . . cornua gestant juxta exortum lata, ac in paucos parvosque teretes ac præacutos ramos divisa, et sub eis oculos quarum imaginem exhibemus (fig. p. 324), deinde in quodam damarum genere quas *Macatlchichiltic* aut *Temamaçame* appellant, brevissimis cornibus acutissimisque, coloris fulvi, fusci, et inferne albi, quarum quoque præstita est imago (fig. p. 325). — *Nard. Ant. Recchus apud Hernandesium*, lib. ix. cap. 14, p. 324 et 325.

These two animals appear to be really roebucks, the first being the same species with the European roebuck, and the second only a variety of it. It likewise appears, that these roebucks, or mazames and temamaçames of Mexico, are the same with the *cuguacu-apara** and the *cuguacu-été* of Brasil; and that, at Cayenne, the first is called *cariacou*, or *wood hind*, and the second the *small cariacou*, or *Savannah hind* †. Though we have first exhibited these relations, yet we would not have presumed that every difficulty or doubt was removed, if Seba ‡ had not given, under the denominations

* The figure of Piso's *cuguacu-été*, p. 98, has a perfect resemblance to our roebuck; and we have only to compare it with that of Recchi's mazame, to be satisfied that it is the same animal. This cuguacu-été of Piso has palmated horns; yet Marcgraave, though he has given no figure, tells us, that it has no horns, and that it is the *cuguacu-apara*, which has horns with three antlers. As in the roe-deer, the female has no horns, it is probable that the individual pointed out by Marcgraave was the female. The descriptions given of these animals by Piso and Marcgraave demonstrate that they are roebucks, perfectly similar to those of Europe.

† *Cervus major corniculis brevissimis*, wood hind. *Cervus minor palustris, corniculis brevissimis*, the Savannah hind, so called because she generally frequents marshy grounds. In Cayenne, *hind* is the general denomination for both the female and male stag, even when the latter has his horns in the greatest perfection.—*Barrère, Essai sur l'Hist. Nat. de la France Equinoxiale*, p. 171.

‡ Tabula quadragesima secunda, No. 3. Mazame seu cervus cornutus, ex nova Hispania. Hæc species omnino differt ab illa quam Guinea profert. Capite et collo, crassis curtisque est, et bina gerit tornata quasi cornicula, in acutum recurvumque apicem convergentia, retrorsum reclinata. Au-

of *mazame* and *temamaçame*, two different animals: they are not roebucks with horns solid and palmated, but gazelles with hollow and twisted horns. They are not natives of New Spain, as this author affirms, but of Africa. These blunders of Seba have been adopted by most subsequent naturalists. They never doubted but that the animals mentioned by Seba, under the names of *mazame* and *temamaçame*, were

riculæ grandes, flaccidæ: at oculi venusti. Cauda crassa, obtusa. Pilus totius corporis subrufus est, paulo tamen dilutior qui caput et ventrem tegit. Femora cum pedibus admodum habilia.

No. 4. Cervus *Macatlchichiltic Temamaçama* dictus. Horum ingens numerus per alta montium et rupium novæ Hispaniæ divagatur, qui gramine, foliis, herbisque victitantes, cursu saltuque velocissimi sunt. Europæos cervos habitu referunt, sed instar hinulorum, valde parvi. Cornua tornata recurvatum in acumen convergunt, quæ singulis annis nova spira aucta, ætatem animalis produnt. Cornuum color coracinus. Oculi auresque magni et agiles. Dentes prægrandes et lati. Cauda pilis longis obsita; brevioribus et dilute spadiceis universum corpus vestitur. Fr. Hernandesius aliam prorsus horum ideam exhibet, putans veram hanc esse speciem capri cervarum, e quibus lap. bezoar acquiritur: qua tamen de re diversa penitus percepimus. Notissimum est lapidem bezoar fortuita quadam concretione, in ventriculo animalium nasci, haud secus ac in renibus et vesica hominum calculi generantur. Neque una dumtaxat animantium species lapides hosce profert; sed variæ cervorum, caprarum, hædulorum, et aliorum, quorum in ventriculo plerumque isti concrescunt, nucleum seu basin, dante frustulo quodam ligni, straminis culmo aut lapillo; quæ, si non comminuta nec commansa degluttiuntur, in ventriculum delata, dissolvi nequeunt: his tunc ibi detentis circum accrescit calcaria quædam crusta, sensim aucta; donec a tunica ventriculi secedens lapis, ita conflatus, cum excrementis per alvum exoneretur.—*Seba.*

American animals, and the same with those taken notice of by Hernandes, Recchi, and Fernandes. The confusion of the names has given rise to a confusion of the animals themselves: and, of course, some naturalists have pointed them out under the name of *chevrotains* *, and others under that of *gazelles* †, or *goats*. Linnæus seems to have been aware of this error; for he has not copied it. He has placed the mazame among the list of stags, and he has thought, as we do, that the Mexican mazame ‡ is the same animal with the cuguacu of Brasil.

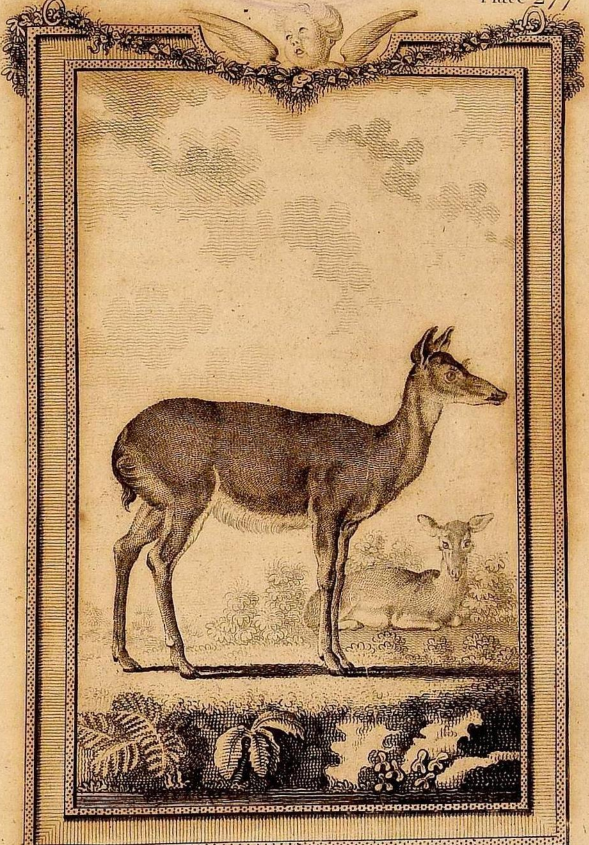
To demonstrate what we have advanced, let us suppose, that there are neither gazelles nor chevrotains in New Spain, or in any other part of America; that there were no goats or ga-

* Tragulus, Temamaçame. . . . . Tragulus, Mazame.—*Klein. de Quad.* p. 21.

† Hircus cornibus teretibus, erectis, ab imo ad summum spiraliter, intortis. . . . . . Capra Novæ Hispaniæ. La Chevre de la Nouvelle Espagne.—*Brisson. Regn. Anim.* p. 72. (Le Mazame de Seba.) Hircus cornibus teretibus circa medium inflexis; ab origine ad flexuram spiraliter canaliculatis, a flexura ad apicem lævibus. . . . . . Gazella Novæ Hispaniæ. La Gazelle de la Nouvelle-Espagne.—*Ibid.* p. 70. (Le Temamaçame de Seba.)

‡ Bezoarticus. Cervus cornibus ramosis teretibus erectis: Ramis tribus. Mazama.—*Hernand. Mex.* p. 324. Cuguacu; &c.—*Marcgrav. Brass.* p. 235.—*Pis. Brass.* p. 98.—*Ray, Quad.* p. 90. Habitat in America australi.—*Linn. Syst. Nat.* edit. 10, p. 67. Linnæus, in his 12th edit. has ranked this animal among the goats, and defines it in this manner: ".Capra bezoarticus, cornibus teretibus arcuatis, talis annulatis, gula barbata."—*Linn. Syst. Nat.* p. 96.

Plate 277



A. Bell Sculp.t

CARIACOU.

zelles in the New World before it was discovered, but that all those which are now there were transported thither from the Old Continent; that the true mazame of Mexico is the same animal with the Brasilian cuguacu-apara; that the name *cuguacu* is pronounced *couguacou*; and that, by a corruption, this animal was called *cariacou* in Cayenne, from which it was transmitted to us alive, under the denomination of *cariacou*. We shall now endeavour to investigate the species of the two animals to which Seba has falsely applied the names *mazame* and *temamaçame*; for, to destroy an error, it is not enough to reject it, but its cause and effects must also be exhibited.

The gazelles and chevrotains inhabit only the warmest countries of the Old World. They cannot subsist in temperate, and far less in cold climates. Hence they could never frequent the northern regions, nor pass, by means of these regions, from the one continent to the other. No travellers, accordingly, or historians of the New World, ever pretend to have seen gazelles or chevrotains in that quarter of the globe. The stag and roebuck, on the contrary, are natives of cold and temperate climates. They might, therefore, pass, by means of the northern lands, and, accordingly, they are found in both continents. In the history of the stag, it was shown *, that the Canadian stag is the same with

* See article Stag.

the European; and that he is only smaller, and has some trifling variations in the figure of his horns and the colour of his hair. We may add to what was then related, that there are as many varieties among the American as among the European stags; and yet they are all of the same species. Of one of these varieties, namely, the Corsican stag, we have given a figure *. It is smaller and browner than the common kind. We have also mentioned white stags and hinds, and have attributed this colour to their domestic state: this kind is likewise found in America †, as well as our common and small brown stags. The Mexicans, who reared these white stags in their parks, called them *royal stags*. It is a native of Germany, commonly called the *stag of Ardennes* and *brandhirts* by the Germans. It is fully as large as the French stags, from which it differs by some remarkable characters. Its hair is more bushy, and lighter under the

* See plate 69.

† Inter cervorum genera quæ apud novam hanc Hispaniam adhuc mihi videre licuit (præter candidos totos, quos reges Cervorum esse Indi sibi persuasere, nuncupantque a colore *Yztac mazame*, et vocatos *Tlamacaz quemacatl*) primi sunt quos vocant *Aculliame*, Hispanicis omnino similes forma, magnitudine ac reliqua natura; minores his apparent *Quauht maçame*, sed usque adeo a cæterorum timididate alieni, ut vulnerati homines ipsos adoriantur ac sæpenumero interimant: hos sequuntur magnitudine *Tlalhuicamaçame*, qui forma et moribus essent eis omnino similes, ni timidiores viderentur; Minimi omnium *temamaçame* sunt. — *Nard. Ant. Recchus, apud Hernand.* p. 324 et 325.

belly; and, like the he-goat, it has long hairs upon its neck and throat, which induced both the ancients * and moderns †, to give it the appellation of *trage-laphus* or *goat-hart*. The roebucks are likewise very numerous in America. In Europe, we know only two varieties, the red and the brown ‡. The latter are smaller than the former; but, in other respects, they perfectly resemble each other, and both

* Eadem est specie (cervi scilicet) barba tantum et armorum villo distans quem *tragelaphon* vocant; non alibi quam juxta Phasin amnem nascens. — *Plinii Hist. Nat.* lib. viii. c. 33. This race of stags is now found in the forests of Germany and Bohemia, as, in the days of Pliny, they frequented the banks of the Phasis.

† Agricula, tragelaphum interpretatur, Germanice dictam feram *ein Brandhirse.* Tragelaphus, inquit, et cervus in sylvis cubant. . . . . Tragelaphus ex hirco et cervo nomen invenit, nam hirci quidem instar videtur esse barbatus, quod ei villi nigri sint in gutture et in armis longi; cervi vero gerit speciem; eo tamen multo est crassior et robustior. Cervinus etiam ipsi color insidet, sed nonnihil nigrescens, unde nomen Germanicum traxit. Veruntamen suprema dorsi pars cinerea est, ventris subnigra, non ut cervis candida, atque illius villi circa genitalia nigerrimi sunt. Cæteris non differunt uterque in nostris sylvis, quamquam plures tragelaphi in his quæ finitimæ sunt Boëmicis quam in aliis reperiuntur. — *Agricola apud Gesnerum Hist. Quad.* p. 296 et 297. Alterum cervi genus ignotius quod Græco nomine *Tragelaphus* dicitur. Priore (cervi scilicet vulgaris) majus, pinguius, tum pilo densius et colore nigrius; unde Germanis, a semiusti ligni colore, *Brandhirtz* nominatur; hoc in Misenæ saltibus Boëmiæ vicinis capitur. — *Fabricius apud Gesnerum*, p. 297, *cum Icone* p. 296.

‡ See article Roebuck.

have palmated horns. The mazame of Mexico, the cuguacu-apara of Brasil, and the cariacou, or wood-hind, of Cayenne, have an entire resemblance to our red roebucks. To be convinced that all these names denote the same animal, we have only to compare the descriptions given under them. But the temamaçame, which, in our opinion, is the cuguacu-été of Brasil, the small cariacou, or Savannah hind of Cayenne, may be only a variety different from those of Europe. The temamaçame is smaller, and has also a whiter belly than the mazame, in the same manner as our brown roebuck is smaller, and has a whiter belly than the red kind. It appears likewise to differ from the mazame in its horns, which are simple, and without antlers, in the figure given by Recchi. But, if it be considered, that, in our roebucks and stags, the horns have no antlers during the first, and sometimes the second year of their age, we shall be led to believe that Recchi's temamaçame was too young to have antlers. Hence these two animals seem to be only varieties of the roebuck species, which will be still farther apparent from comparing the figures and descriptions of the different authors we have quoted, with the figure here given of a cariacou which was sent us from Cayenne, and which we nourished in Burgundy for several years.

It now remains to investigate the two animals exhibited by Seba under the false appellations of *mazame* and *temamaçame*. The bare inspec-

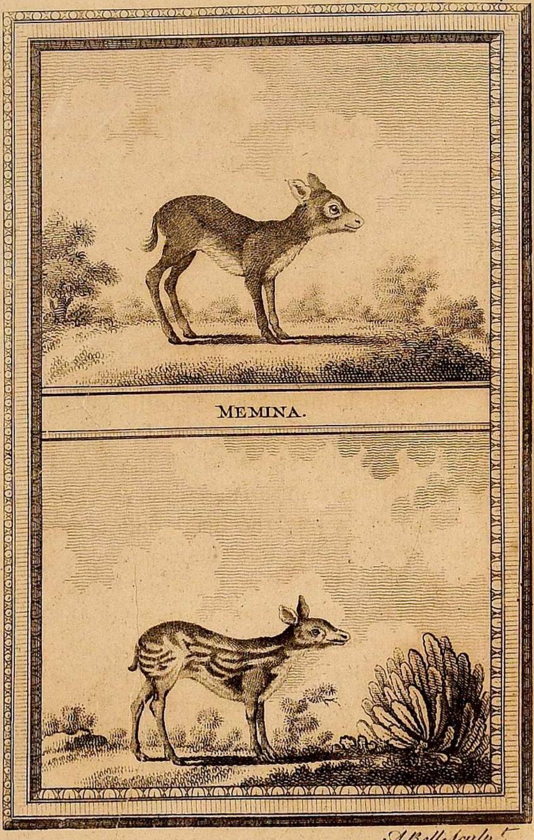
tion of the figures, independent of his description, which we have inserted above in the notes, shows that these animals belong to the goats or gazelles, and by no means to the stags or roebucks. The want of a beard, and the figure of the horns, prove that they are not goats, but gazelles; and, by comparing Seba's figures with the gazelles I have described, I discovered, that his pretended *temamaçame of New Spain* is the *kob*, or *small brown cow of Senegal.* The figure, colour, and size of the horns are the same. The colour of the hair, which differs from other gazelles, by being yellow, instead of white, on the belly and flanks, is also the same. With regard to his pretended *mazame*, though it has a general resemblance to the gazelles, it differs remarkably from all those we have formerly enumerated. But we have found, in the cabinet of M. Adanson, which contains the rarest productions of Senegal, a stuffed animal, which we called *nagor*, on account of the resemblance of its horns to those of the nanguer *. This animal is found

* Capra a D. Andriot missa. Differt a nanguer. Longitudo ab apice rostri ad anum quatuor fere pedum; ab ano ad pectus duo pedes cum dimidio. Altitudo a pedibus anticis ad dorsum duo pedes et tres pollices; a pedibus posticis duo pedes cum dimidio. Ventris longitudo inter pedes, pedem unum et tres pollices; ventris crassities decem pollices. Caput longum novem pollices; altum sex, latum quatuor cum dimidio. Cornua longa quinque pollices cum dimidio; lata unum pollicem cum dimidio. Apices cornuum distant sex pollicibus; aures longæ quinque pollicum; cornua basi 1 ad

in the lands adjacent to the island of Goree, from which it was transmitted to M. Adanson, by M. Andriot, and possesses all the characters which Seba has attributed to his pretended *mazame*. The whole body is of a pale red colour; and the belly is not white, as in the other gazelles. It is as large as a roebuck. Its horns, which exceed not six inches in length, are almost smooth, slightly bended in a forward direction, but not so much as those of the nanguer. Hence this animal, exhibited by Seba under the name of *mazame*, or *American stag*, is, on the contrary, an *African goat* or *gazelle*, which we add here, under the appellation of *nagor* *, to the gazelles, whose history we have formerly given.

2 annulis lèvibus cincta; color totus rufus. Pili mediocres, rigidi, lucidi, unum pollicem longi, corpori non adpressi. MS. Note accompanying the stuffed animal which we borrowed from M. Adanson, in order to make a drawing of it.

* The red antelope, with horns five inches and a half long, and one or two slight rings at the base. The length of this animal is four feet, and the height two feet three inches. The ears are five inches long. The hairs are stiff and bright. All parts of the body are of a reddish colour. — *Penn. Synops. Quadr.* p. 30.



A. Bell Sculp.t

MEMINA of CYLON.

THE CHEVROTAINS, O
ANTELOPES *

THE name *chevrotain* (*tragi*
applied to those small animals
regions of Africa and Asia which a
by almost every traveller unde
tion of the *small stag*, or the *sm*
indeed, resemble the stag in th
muzzle, in lightness of body, in
limbs, and in the shortness of
they differ from him prodigiously—in size, the largest not exceeding the magnitude of a hare. Besides, some of them want horns entirely; and, in those which have horns, they are hollow, annulated, and pretty similar to those of the gazelles. Their small cloven foot has also a greater resemblance to the foot of the gazelle than to that of the stag; and their want of pits, or depressions under the eyes, removes them equally from the gazelles and the stags. In this article they approach the goats: but, in fact, they are

* In modern Latin, *Tragulus*; in Senegal, *Guevei*. According to M. Adanson, the smallest kind is called *Guevei-kaior*, because it inhabits the province of *Kaior*, which includes Cape Verd and the country adjacent.

azelles, nor goats, but constitute
listinct species. Seba gives a de-
gures of five chevrotains *. The

agesima et tertia, No. 1. Cerva parvula,
a, rubida, sine cornibus. Licet admodum
nen sua in specie maxima est; quum con-
nque aliquantum minores deprehendantur.
i æmulem, cornibus tamen caret. Cursu
æ sunt, longis, gracilibusque pedibus, in
n magnis cervis, concinne fissis, innixæ:
eum in parvam ungulam elongatur, uti in
crassus et rotundus est. Pilus dorsi ex fusco
et sub collo albicat. Cauda minus longa,
pilis vestita, ex fusco, rubro, et albo va-
postica facies in hac dilutissime spadicea
repræsentamus. Pabulum horumce ani-
sunt graminum, aliarumque herbarum.
nontes conscendunt, difficillime, nec nisi
aptandæ. Summas inter delicias ciborum,
et pro ferina optima habentur; quo etiam nomine dignis-
simorum munerum administratoribus, illis in locis, dono
dantur.

No. 2. Hinnulus, seu cervus juvencus, pergracilis, Africanus. Salientis hic in gestu constitutus, tenui gracilique est corpore, atque articulis, instar canis venatici, priori congener, et concolor. Auriculæ mediocriter prolixæ sunt. Cauda, sursum recurvata, quasi crispata est. Maxilla inferior insignes dentes a primo ortu gerit. Pedes, tanquam res pretiosa, aurum circumclusi, loco pistillorum, ad nicotianam in fistulas adigendam, usurpantur. Sub lit. A. ejusmodi repræsentatur.

No. 3. Cervus juvencus, perpusillus, Guineensis. Minima hæc species est inter omnes quas hactenus hisce in oris videre licuit: quanquam in nostro musæo pedes minoris adhuc asservemus, prout lit. B. demonstrat. Dantur et aliæ species, quæ bina, nigricantia, et acuminata cornicula gerunt; cujusmodi sub lit. C. exhibimus. Quotannis novo annulo notantur cornicula, quorum e numero ætas animalculi suppatatur;

ur, seems to be only a variety of the The fourth, which Seba mentions Surinam, appears to be a second species, which is found in Africa, outhern regions of Asia; and I think, that Seba has been ill in- e tells us, that this animal came All voyagers mention these chevrotains, as being found in Se- , and the East Indies; but no tra- that he has seen them in America. potted rotain really came from we must esume that it had been from Guinea, or some other southern region of the Old World. But there seems to be a second species of chevrotain, different from all those we have mentioned, which are only simple varieties of the first. This second species has horns, which are only an inch in length, and as much in circumference. These small horns are hollow, black, a little bended, very sharp at the points, and surrounded at the base with three or four transverse rings. In the king's cabinet, we have the feet of this animal, and one of its horns; and these parts demonstrate, that it is either a chevrotain, or a very minute gazelle. Kolbe, when mentioning this species, says, that its horns were similar to those of the stag, and that they have branches in proportion to their age*. This is an evident

* In Congo, Viga, Guinea, and other places near the Cape of Good Hope, we find a species of goat which I call the

first he calls the *small African hind fr*
which is reddish, and without hor
cond, *the fawn or young stag of*
is very delicate; the third, *the yo*
stag of Guinea; the fourth, *the s*
rinam, which is reddish, and mar
spots; the fifth, *the African stag*
hair. Of these five *chevrotains*, th
and third, are evidently the same
fifth, which is larger than the th
whose hair is much longer, and

id, quod in bobus quoque obtin notissimum e
Russorum Imperator, quando m æi mei perlu
ad me invisere dignabatur, centum mihi aureo
tam pusillum ipsi cervum procurare possem : sed ...,
quidquid impenderim operæ.

Tabula quadragesima et quarta. No. 2. Cervula Surinamensis, subrubra, albis maculis notata. Caput, pectus, abdomen, et pedes exceperis, quæ unicoloria sunt; reliquum, ex rufo luteum, maculis albis undique tygridis in modum, variegatur; auriculæ grandes, longæ; cauda brevis, obtusa. Cursus rapiditate incredibili vel magnum cervum superat. Memorabile est, cervos Americanos adeo pusillos esse : quum dentur, leporem qui magnitudine haud excedunt; et omnium maxima species altero tanto circiter major sit, quam quæ hac tabula repræsentatur. Cornua vero numquam gerunt, et pro sapidissima ferina habentur.

Tabula quadragesima et quinta. No. 1. Cervus Africanus, pilo rubro. Parvus quidem est; at ista tamen in specie cervorum maximus, quem hic repræsentamus, ex oris Guineæ oriundus. Egimus de his animalculis jam prægressis in tabellis. Interim ut, quantum licet, specierum exhiberetur varietas, hunc quoque æri curavimus incidi; siquidem et specie et pilo discrepet ab aliis. Pilus ei longior est, coloris ex fusco longe obscurioris, quam in præcedentibus. Pedes etiam et crura ejus longiora sunt, et concinne admodum subrefecta. Cæterum cum prioribus convenit. — *Seba,* vol. i. p. 70 et 73.

blunder, as appears from a bare inspection of the horns themselves.

The figure of these animals is eleg their members are finely proportion size. They make prodigious boun probable that they cannot run lo dians overtake them in the chase hunt these animals, and kill t small darts. They are in gr count of the delicacy of their

By comparing the relation pears, 1. That the chevr ...ose have given, and who wa ...e horns, i to the East Indies †; 2. That the one wit

Congo goat.* It is not larger than a hare; but its beau symmetry are truly admirable. Its horns resemble of the stag, and have also branches in proportion to age. Its legs are very handsome, and so small, that inferior part of them is often used as a tobacco s...p. They are mounted with gold or silver. — *Descript. du Cap Bonne Esperance, par Kolbe*, tom. iii. p. 39.

* The inhabitants of a small island near Java bring hind of the size of a hare, which the Indians take in the chase. — *Voyage de la Gentil*, tom. iii. p. 73 et p. 93. There is still another kind of little quadrupeds. They are extremely handsome; their horns are black, and their legs, though proportioned to the size of their bodies, are so slender, that some of them exceed not, in thickness, the stalk of a tobacco-pipe. I send you one ornamented with gold, &c. . . . . These small animals are extremely fleet, and make surprising bounds. I have seen some of those which we seized spring over a wall of ten or twelve feet high. The Negroes call this animal the *king of the harts*. — *Voyage de Guinée, par Bosman*, p. 252.

† The Guinea musk is nine inches and a half long. The

the chevrotain of Senegal, called *guevei* by ...tives *; 3. That the male *guevei* has ...d that the female has none; 4. That ...ain, spotted with white, and which ...rought from Surinam, is, on the

... upper part of the body are tawny, and ... has no spurious hoofs. There are two ...h in the lower jaw, and on each side of ...lender. In the upper jaw, there are ...rs are large, and the tail an inch ...f Mr. Guy, of York-Buildings, who ... M. de Buffon says it is found in

...es.—... ...*ops. of Quad.* p. 59.

...Guineensis.—... *Quad.* p. 66.

...indicus.—*R...in, Quad.* p. 21.

...us pygmæus, pedibus humano digito angustiori- ...*Linn. Syst. Nat.* p. 92.

...e royal antelope has very short, straight horns, black ...ing as jet, and scarce two inches long. The ears are ... and the height not above nine inches. The legs are ...ker than a goose quill. The colour is a reddish brown. ...males want horns.—*Pennant's Synops. of Quad.* ...

...King of the Harts.—*Bosman's Voyage*, p. 236.

Petite biche.—*Desmarchais*, tom. i. p. 312.

Cervula parva Africana.—*Seba Mus.* tom. i. p. 70. tab. 43.—*Adanson's Voyage*, p. 207.

† In the kingdom of Acara, on the Gold Coast, we find hinds so small, that they exceed not eight or nine inches in height. Their legs are not thicker than a goose quill. The males have horns, which bend back on the neck, and are two or three inches long. They have no branches or antlers, but are twisted, and as black and shining as jet. These small animals are very tame, fawning, and caressing; but they are so extremely delicate, that no attempts to transport them into Europe have ever succeeded.—*Voyage de Desmarchais*, tom. i. p. 31. See also *L'Hist. Gen. des Voyages, par M. l'Abbé Prevost*, tom. iv. p. 75.

contrary, a native of the East Indies, and particularly of Ceylon *, where it is called *memina*. We must, therefore, conclude, that there are only two known species of chevrotains, the memina, or Indian kind, without horns, and the guevei or chevrotain of Guinea, with horns; that the five species of Seba are only varieties of the memina; and that the smallest kind, called *guevei-kaior* in Senegal, is only a variety of the guevei.

None of these small animals can subsist, except in very warm climates. They are so extremely delicate, that it is with the utmost difficulty they can be transported alive into Europe, where they soon perish. They are gentle, familiar, and most beautifully shaped. Beyond all comparison, they are the smallest cloven-footed animals. From this last character, they should produce but few young at a litter. From their minuteness, on the contrary, they ought to bring forth a great number. On this subject, we must wait for information from those who have an

* In the island of Ceylon, there is an animal called *memina*, which is not larger than a hare, but has a perfect resemblance to the fallow deer. Its colour is gray, spotted with white, and its flesh is excellent. — *Knox's Hist. of Ceylon*, p. 21. See also *L'Hist. Gen. des Voyages, par M. l'Abbé Prevost*, tom. viii. p. 545.

Indian musk: the length is one foot five inches, and the weight five pounds and a half. It is of a cinereous colour, with the throat, breast, and belly white. The sides and haunches are spotted, and barred, transversely, with white: the ears are long and open, and the tail very short. — *Pennant's Synops. of Quad.* p. 59.

opportunity of observing their economy. We imagine that they bring forth but one or two at a time, like the gazelles, roe-deer, &c. But perhaps they produce more frequently; for they are very numerous in India, Java, Ceylon, Senegal, Congo, and in all the very warm countries; and none of them are found in America, or in any of the temperate regions of the Old Continent.

THE CHEVROTAIN OF CEYLON*.

WE have here added the figure of a chevrotain which differs from that in the original work, where it was remarked, that the skin of the chevrotain is variegated with white spots, and that Seba maintained that it was found in Surinam. It exists not, however, in America, but in the East Indies, where it is called *memina.* Under this denominatoni, we received the skin of a chevrotain from Ceylon, which had a per-

* CHARACTER SPECIFICUS †.

MOSCHUS MEMINNA. M. supra cinereo olivaceus, subtus albus, lateribus albo maculatis, ungulis succenturiatis nullis. — *Linn. Syst. Nat. Gmel.* i. p. 174. — *Schreb.* v. pl. 263. — *Erxleb. Mamm.* p. 322.

MEMINNA. — *Knox, Ceylon,* p. 21.

CHEVROTAIN DE CEYLON. — *Buff. Hist. Nat. par Sonn.* xxxi. p. 179, pl. 19.

INDIAN MUSK. — *Penn. Hist. Quadr.* i. p. 127, pl. 22.

MEMINNA. — *Shaw's Gen. Zool.* ii. p. 256, pl. 173.

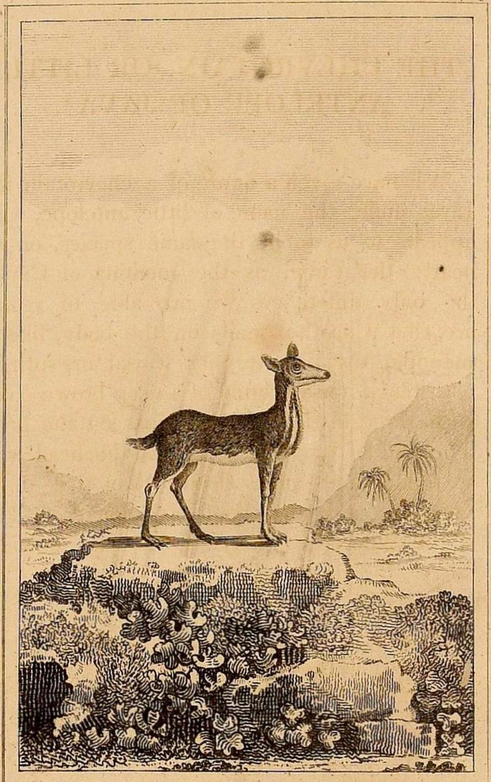
HABITAT

in Ceylona. *W.*

† For the generic character, see Musk.

fect resemblance to the description we had given of it. By comparing this with our original figure, we shall perceive that none of these animals have horns, and that they are both varieties of the same species only.

Plate 279



CHREVOTAIN *of* JAVA.

THE CHEVROTAIN, OR LITTLE ANTELOPE OF JAVA*.

WE have given a figure of a chevrotain from Java, under the name of little antelope, which appears to us to be the same species, or very nearly the same, as the memina of Ceylon; the only differences we are able to remark, are, that it has no bands on the body, like the memina, the hair is only waved or sprinkled with black, on a ground of a d o brown colour, with three distinct white stripes on the breast. The end of the nose is black, the head is not so round, and more slender than that of the memina, and the hoofs are longer. These slight differences may be merely individual,

* CHARACTER SPECIFICUS.

MOSCHUS JAVANICUS. M. supra ferrugineus, subtus longitudinaliter albus, cauda longiuscula villosa subtus et apice alba, ungulis succenturiatis exiguis. — *Linn. Syst. Nat. Gmel.* i. p. 174. — *Pall. Spic. Zool.* xii. p. 18; xiii. p. 28.

LE CHEVROTAIN OU PETITE GAZELLE DE JAVA. — *Buff. Hist. Nat. par Sonn.* xxxi. p. 179, pl. 19.

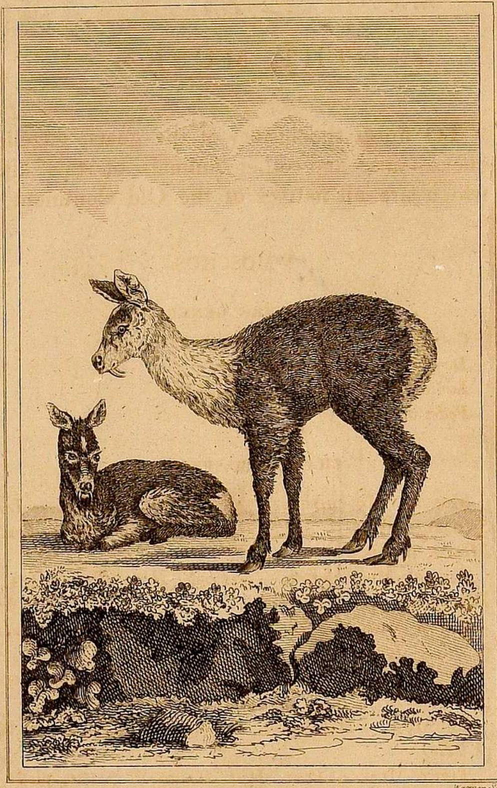
JAVA MUSK. — *Shaw's Gen. Zool.* ii. p. 257, pl. 173.

HABITAT

in Java, W.

and ought not to prevent us from considering this chevrotain of Java as a simple variety of the memina of Ceylon. We have nothing farther to say about this little animal, which certainly is not of the antelope kind, but belongs to the chevrotains.

Plate 280



Warner Sc.

MUSK.

THE MUSK*.

TO finish the history of the goats, gazelles, chevrotains, and other animals of this kind, which are all natives of the Old Continent, it

* MOSCHUS.

CHARACTER GENERICUS.

Cornua nulla.
Dentes primores inferiores octo.
Laniarii superiores solitarii exserti.
Pedes ungulati.

CHARACTER SPECIFICUS.

MOSCHUS MOSCHIFERUS. M. folliculo umbilicali.—*Linn. Syst. Nat. Gmel.* i. p. 172.—*Schreb.* v. pl. 262.—*Erxleb. Mamm.* p. 319.

Animal Moschiferum.—*Nieremb. Hist. Nat.* p. 184.—*Ray's Quadr.* p. 127.

CAPRA MOSCHI.—*Aldrov. Bisulc.* p. 743.—*Gesn. Quadr.* p. 786.—*Jonst. Quadr.* p. 78.

Tragulus (Moschus) ad umbilicum folliculum moschiferum gerens.—*Briss. Regn. An.* p. 97.

LE MUSC.—*Buff. Hist. Nat. par Sonn.* xxxi. p. 201, pl. 21.

TIBET MUSK.—*Penn. Hist. Quadr.* i. p. 124, pl. 21.—*Shaw's Gen. Zool.* ii. p. 249, pl. 171.

HABITAT

in Tibetano regno, provincia Mohang Meng Sinensi, in

now only remains to give that of the musk, an animal as famous as it is little known. It has been mentioned by all our modern naturalists, and by most travellers into Asia. Some of them have considered it as a *stag*, a *roebuck*, or a *musk goat*, and others as a large *chevrotain*. It seems, indeed, to be an ambiguous animal, participating of the nature of all these species. We may be assured, however, that its species is distinct, and different from all the other quadrupeds. It is of the size of a small roebuck; but has no horns. By this character, it resembles

Tonkin et Boutan, ad lacum Baikal, ad Jeniseiam atque Argunum; in pinetis montosis, solitarius, misantropus. Asilum quærit in summis rupibus, Mansuescit tamen.

W.

The Tibet musk is of the form of a roebuck: length three feet three inches; from the top of the shoulders to the soles of the feet, two feet three inches. The upper jaw is much longer than the lower: on each side of which there is a slender tusk, near two inches long, hanging out quite exposed to view. In the lower jaw are eight small cutting teeth, none in the upper, and in each jaw six grinders. The ears are long and narrow, the inside of a pale yellow, the outside deep brown. The chin is yellow. The hair on the whole body is erect, very long, and each marked with short waves from top to bottom. The colour near the lower part is cinereous, black near the end, and ferruginous at the tips. The hoofs are slender and black; and the spurious hoofs of the fore-feet are very long. The tail is an inch long, hid in the hair. The scrotum is of a bright red colour; but the penis is so hid as scarce to be discovered. The female is less than the male, and her nose sharper. She wants the two tusks, and has two small teats. The noted drug, the musk, is found in a bag or tumour, of the size of a hen's egg, on the belly of the male only.—*Penn. Synops. Quadr.* p. 56.

the *meminna*, or Indian musk. It has two large tusks in the upper jaw, by which it approaches to the Guinea musk. But what distinguishes the musk from all other animals, is a kind of bag near its navel, about two or three inches in diameter, in which the liquor, or rather fat humour, called *musk*, is secreted, and which differs both in odour and consistence from that of the civet. Neither the Greeks nor Romans mention this animal. It was first taken notice of by the Arabians *. Gesner, Aldrovandus, Kircher †, and Boym, have treated pretty fully of

* Abusseid Serasi remarks, that the musk animal resembles the roebuck in the skin and colour, in the slenderness of the legs, in the hoofs, in the *erect and somewhat bended horns;* and that it is armed with two white tusks on the side of each cheek. This author alone asserts, that the musk animal has horns; he has perhaps conjectured, from analogy, that, as it resembled the roebuck in other respects, it ought likewise to have horns. We have taken notice of this error, because it is copied by Aldrovandus. Avicenna, when speaking of the musk, says, that it is the purse or follicle of an animal pretty similar to the roebuck, only it has two large crooked tusks. There is a figure of this animal in the fragment of Cosmas, printed in the first volume of Tavernier's Travels.

† I say, in the first place, that there is a certain stag in the provinces of Xensi and Chiamsi, which has a fine odour, and is called by the Chinese *Xerchiam,* that is, the *musk animal.* The Chinese Atlas mentions it in the following terms: "To keep you no longer in suspense concerning the signification of the word *muschus,* I can assure you that I have seen the animal oftener than once. It has a protuberance near the navel, which resembles a small purse, because it is surrounded with a very delicate skin, and covered with soft hair. The Chinese call this animal *xe,* which signifies *odour,* and the

this animal; but Grew * is the only author who has given an exact description of it from a stuffed skin, which, in his time, was preserved

compound word *xehiang* denotes the odour of the animal *xe*, or *se*, muschus." It is four feet long, and as swift as a stag. The only difference is, that its hair is blacker, and it has no horns. The Chinese eat its flesh, which is very delicate. The provinces of Suchuen and Junnan abound with these animals, and they are most numerous in the western provinces of China.—*La Chine Illustrée de Kircher*, p. 256.

* The musk deer breeds in China and the East Indies. Not ill pictured in Calceolarius's museum. That in Kircher's *China Illustrata* faulty as to the snout and feet. That of Johnston absurd. Almost every where worse described. That he is a two-horned animal, says Aldrovandus, all agree, except Simeon Sethi, who saith he hath but one. Neither of which is true. The description likewise given by Scaliger, and out of him by Chiocco in Calceolarius's museum, is false, and very defective. The best I find is among the German Transactions; to which I would have referred the reader, but that, comparing it with that I had drawn up before I met with it, I see some differences.

From his nose and to his tail, a yard and half a foot long. His head above half a foot. His neck one-fourth of a yard. His forehead three inches broad. His nose-end scarce three-fourths of an inch, being very sharp, like that of a grey-hound. His ears like a coney's, about three inches long, and erect. As also his tail, or scut, which exceeds not two inches. His fore-legs, a foot and two inches long, taking in foot and thigh. Near an inch over; the foot deeply cloven; with two fore-hoofs, an inch and a quarter long, each a quarter of an inch over; and two heels almost as big, and therefore conspicuous. His hinder feet are here wanting.

His hair on his head and legs about half an inch long, and rateably small. On his belly, an inch and a half long, and somewhat thicker. On his back and buttocks three inches long, thicker in proportion than any other animal, except, perhaps, some of the deer kind, sc. three or four times as thick

in the cabinet of the Royal Society of London. This description I have copied in the note. The year after the publication of Grew's work, in 1681, Luc Schrockius † printed at Vienna

as hog bristles; consisting of brown and white portions alternately from the root to the top. On the head and legs, brown. On the belly and under the scut, whitish. As it were frizzled, especially on the back and belly, by a kind of undulation. Softer than in most animals, and exceeding light and rare. For, being split, and covered with a gloss, they appear to be made up of little bladders, like those in the plume or stalk of a quill; so that it is a thing betwixt a common hair and a quill. On each side his lower chop, almost under the corner of his mouth, there is a peculiar tuft (about three-fourths of an inch long), of short, thick, and hard hairs, or rather bristles, of equal length, as in a scrubbing brush.

The musk bladder, or bag, is about three inches long, two over, and swelling out from his belly one and a half. Standing before his groin about as much. I find it cut open, whereby the observation of its natural aperture (which I suppose it hath as the castor bag) is prevented.

He hath twenty-six teeth. In his lower chop, sixteen; of which there are eight little cutters before; behind, four grinders on each side, rugged and continuous. As many like grinders in the upper jaw. About an inch and a half from the nose-end, in the same jaw, on each side a tusk, two inches and a half long, hooked downward and backward, and ending in a point. Not round but flat, the breadth of half an inch; thin, and having a sharp edge behind; so as it may not unfitly be likened to a scythe. There are no horns.—*Grew's Museum*, p. 21.

† Schrockius gives a figure, but no description, of this animal. He only remarks, that it resembles a roebuck, with the exception of having two prominent tusks in the upper jaw, about three inches long, and directed downward; that this is the chief characteristic of the animal; that it varies in the colour of its hair; that its head likewise differs from the roebuck, and approaches to that of the wolf; that the hair is

the history of this animal, which contains nothing remarkable either for correctness or novelty.

Marco Paolo, Barbosa, and P. Philippe de Marini, are all more or less deceived in the notices they have given concerning this animal *.

generally marked with several spots; and that the protuberance which contains the musk is situated a little below the navel. He adds, that this animal is found in Tartary, in Tibet, in China, and particularly in the province of Xinsi, in Tonquin, in Pegu, in the kingdom of Aracan, and in Boutan. p. 32—57.

* Paolo describes it in this manner: — Its hair is coarse, like that of the stag. It has the feet and tail of a gazelle, and no horns *any more than that animal.* It has *four* teeth in the upper jaw, about three inches long, which are as delicate and white as ivory; two of them rise upward, and two turn downward; and the creature is exceedingly beautiful. During *the full moon,* it is affected with an imposthume on the belly near the navel; and at this time the hunters seize the animal, and open the imposthume. Barbosa says, that it is very like the gazelle; but he agrees not with other authors, when he tells us that its hair is white. The following are his words: "The *musk* is found in small white animals which resemble gazelles, and have tusks like elephants, though much smaller. A kind of imposthume forms under the belly and breast of these animals, and, when the matter is ripe, the tumour grows so itchy, that they rub it against the trees: the matter which falls down in small grains is the most perfect *musk.*" Thevenot's description seems to correspond still better with the others. "In these countries," says he, "there is an animal with a muzzle similar to that of the fox, but whose body exceeds not the size of a hare. His hair resembles that of the stag, and he has the teeth of a dog: he produces excellent musk in a bladder under the belly, which is full of corrupted blood; and this blood composes, or rather is the musk itself. The natives cut away this bladder, and

The only fact in which they agree is, that the *musk* is formed in a pouch or tumour near the navel; and it appears from their testimonies, as well as those of other travellers, that the male alone produces the *musk*; that the female has the same pouch near the navel, but that the humour secreted in it has not the same odour; that this tumour of the male is not filled with *musk*, except in the rutting season; and that, at other times, the quantity of this humour is smaller, and its odour weaker.

We have engraved the musk animal from a drawing after nature: the figure has never

cover the cut part of it with leather, to prevent the dissipation of the odour. But, after this operation, the animal soon dies." The description given by Pigafetta, who says that the musk is of the size of a cat, corresponds not with that of other authors; neither does that of P. Philippe, who makes the head of the musk resemble the head of a wolf: and P. Kircher, in the figure he has given of this animal, represents it with the snout of a hog, which is perhaps an error of the engraver, who has likewise given it claws instead of cloven hoofs. Simeon Sethi recedes still farther from truth, when he makes the musk as large as a unicorn, and even a species of that animal. "The *musk* of least value," says he, "is brought from China and the East Indies, and is of a blackish colour. The *musk* is formed below the navel of a large animal with one horn, and which has a resemblance to the roebuck. In the rutting season, a mass of clotted blood collects round his navel, and produces a swelling, the pain of which prevents him from eating or drinking: he then rolls himself on the earth, breaks the tumour, and discharges the blood, which, after coagulating, acquires a fine odour." All these authors agree, in the manner in which the *musk* is formed in a bladder or tumour near the navel, when the animal ruts. —*Anciennes Relations des Indes et de la Chine*, p. 216.

been given, but in a very incorrect manner, by other naturalists. It appears that this animal, which is common only in the eastern parts of Asia, may be naturalized, and perhaps even propagated, in our climate, for it does not require any particular care. It has lived three years in the park of the duke of Vrilliere, at the Hermitage near Versailles, where it did not arrive till June, 1772, after being three years on the road. Thus, it suffered six years of captivity and uneasiness, during which time it was very well maintained, and did not die of decay, but of an accidental disorder. We were recommended to feed it with rice broken in water, and with the crumb of bread mixed with oak moss. We exactly followed this direction: it was always in good condition, and its death, in April, 1775, was occasioned only by an *ægragrophilus*; that is to say, by a ball of its own hair, which it had licked and swallowed. M. Daubenton, of the Academy of Sciences, who dissected this animal, found the ball in the stomach, at the orifice of the pylorus. It was not much afraid of cold, nevertheless, to screen it in the winter, it was kept in an orangery; and, during the whole of that season, it had no smell of *musk*, but it was very strong scented in the summer, especially in the hottest weather: when it was at liberty, it did not walk by measured steps, but ran and leaped, somewhat like a hare.

With regard to the *musk* itself, its essence is perhaps as little known as the nature of the

animal from which it is procured. All travellers agree, that this substance is perpetually adulterated with blood, or other drugs, by the venders. The Chinese not only augment its size, by mixture, but they endeavour to increase its weight by incorporating with it finely powdered lead. The *musk* that is purest, and in most request among the Chinese themselves, is that which drops spontaneously from the animal upon stones or trunks of trees, against which it rubs, when the matter is too abundant, or begins to irritate the pouch where it is formed: that found in the pouch itself is seldom so good; because it is not fully ripe, or rather because it is during the rutting season only that it acquires its greatest strength and odour; and, at this period, the animal endeavours to get rid of a matter which is too highly exalted, and occasions itching and some degree of pain. Both Chardin * and Ta-

* It is well known, that *musk* is the excrementitious matter of an animal which resembles the wild goat, except that its body and limbs are more delicate. It is found in High Tartary, in the north of China, and in Tibet, which is a kingdom between India and China. I never saw these animals alive, but I have seen their skins in many places. There are figures of them in the Dutch ambassador's lodgings at China, and in the *China Illustrata* of Kircher. It is commonly said, that the *musk* is the sweat of the animal, which runs down and is collected in a thin bladder near the navel. But the natives of the east tell us, with more precision, that it is formed in an abscess within the body, and near the navel of this goat, the humour of which produces an itching and prickling pain, especially when the animal is in season; that, by rubbing against trees or rocks, the abscess bursts, and the matter is diffused between the muscles and the skin, where it collects and forms

vernier have well described the methods practised by the orientals to adulterate *musk*. The

a kind of blister or bladder; and that the internal heat exalts this corrupted blood, and gives it the strong odour of *musk*. This bladder is called *the navel of the musk*, or *the odoriferous navel*. The eastern people prefer the Tibet *musk* to that of China, whether it is really a stronger odour, or only appears so, because it arrives to them fresher, Tibet being nearer to them than the province of Xinsi, which produces more *musk* than any other district of China. The great *musk* trade is carried on at Boutan, a celebrated town in the kingdom of Tibet. The Patans go there to purchase it; and they distribute it all over India, from whence it is transported through the whole earth. The Patans border on Persia and High Tartary, and are subject, or rather tributary, to the Great Mogul. The Indians make great use of this aromatic drug. They employ it in their perfumes, confections, and every composition they have been accustomed to prepare for the purposes of provoking love, or of restoring lost vigour. The women use it to dissipate the vapours, which ascend from the uterus to the brain, by fixing a bladder of it on their navel; and when the vapours are violent and perpetual, they take the *musk* out of the bladder, tie it in a small linen bag, and apply it to a place which modesty permits not to be named. . . . It is commonly alleged, that, when the musk-bag is cut open, so strong an odour bursts out, that the hunter is obliged to have his mouth and nose covered with several folds of linen; and that, notwithstanding this precaution, the force of the odour is often so great as to produce a mortal hæmorrhagy. I made a particular inquiry into this fact, and, having heard similar accounts from some Armenians who had been at Boutan, I am inclined to think it is true; because this drug, instead of acquiring, loses its odour in process of time. Now, this odour is so strong in India, that I was unable to bear it. When I dealt in *musk*, I stood always in the open air, with a handkerchief on my face, and at a distance from those who handled the bladders, and brought them to my broker. I then perceived that *musk*, when fresh, is extremely heady, and quite

merchants must necessarily augment the quantity of it beyond conception; for, in one year, Tavernier* purchased 1,663 bags, which supposes

insupportable. I shall only add, that there is no drug so easily or so frequently adulterated. Some bags are only pieces of the animal's skin, filled with its blood, and a small quantity of *musk*, to give it an odour, instead of that bladder formed by the wisdom of Nature near the navel to receive this wonderful and odoriferous humour. With regard to the genuine bladders, when the hunters find that they are not full, they squeeze the animal's belly, and fill them with blood; for they believe that the blood of the musk, and even its flesh, has a fine scent. The merchants afterwards mix the *musk* with lead, ox's blood, and other substances proper for augmenting its weight. The eastern people employ several modes of detecting this falsification, without opening the bag: they learn from experience to distinguish the proper weight of an unadulterated bag. They likewise know by the taste. Hence the Indians never purchase *musk* without tasting small grains of it, which they squeeze out of the bags. In fine, they take a thread steeped in garlic juice, and draw it through the bag with a needle: if the odour of the garlic be extinguished, the *musk* is good, and if the thread preserves the scent of the garlick, the *musk* is adulterated.—*Voyage de Chardin,* tom. ii. p. 16.

* The best and the greatest quantities of *musk* come from the kingdom of Boutan, from which it is carried for sale to Patna, the chief town of Bengal. All the *musk* sold in Persia is transported from thence. I had the curiosity to carry a skin of this animal to Paris, and have given a figure of it.

After killing the animal, the peasants cut off the bag, which is of the size of an egg, and is situated nearer the organs of generation than the navel. They next take out the *musk*, which then has the appearance of clotted blood. When they want to adulterate it, they put a mash of the animal's liver and blood in the place of the musk they had extracted. In two or three years, this mixture produces certain small animals, which eat the good *musk*; so that, when opened, a great defalcation is discovered. Others, after extracting a portion

an equal number of animals. But, as this animal is no where domestic, and the species confined to a few provinces of the east, it cannot

of the musk, put in small pieces of lead, to augment the weight. The merchants who transport *musk* to foreign countries love this trick better than the other, because none of these small animals are produced by it. But the deceit is still worse to discover, when, of the skin taken from the belly of a young animal, they make little bags, which they sew so dexterously with threads of the same skin, that they resemble genuine bags. These they fill with what they take out of the genuine bags, and some fraudulent mixture, which it is extremely difficult for the merchants to detect. When the bags are sewed, immediately upon their being cut, without allowing any part of the odour to dissipate in the air, after they have abstracted as much of the *musk* as they think proper, if a person applies one of these bags to his nose, blood will be drawn by the mere force of the odour, which must necessarily be weakened or diluted, in order to render it agreeable, without injuring the brain. The odour of the animal I brought to Paris was so strong, that it was impossible to keep it in my chamber. It made every head in the house giddy; and I was obliged to put it in a barn, where my servants at last cut away the bag: the skin, notwithstanding, always retained a portion of the odour. These animals are not found in a lower latitude than the fifty-sixth degree. But in the sixtieth they are very numerous, the country being full of woods. In the months of February and March, it is true, after suffering much hunger in their favourite clime, on account of the snow, which is sometimes ten or twelve feet deep, they come southward as far as the forty-fourth or forty-fifth degree, in order to procure grain or fresh rice. During this period, the peasants lie in wait for these animals with snares, and kill them with arrows and bludgeons. Some of them, I was assured, are so meager and languishing with the hunger they suffer, that they are easily taken. These animals must be extremely numerous; for each of them has but one bag, and the largest bag, which seldom exceeds the size of a hen's egg, cannot furnish above

possibly be so numerous as to produce such a quantity of this matter. Most of these pretended bags, therefore, must be little artificial bladders made of the skin of other parts of the animal's body, and filled with blood and small portions of the true *musk*. It affords, in fact, the strongest of all known odours. A small bit of it perfumes a large quantity of matter. The odour of a small particle extends through a considerable space. It is likewise so fixed and permanent, that, at the end of several years, it seems to have lost no part of its activity *.

half an ounce of *musk*: three or four of them are sometimes necessary to afford a single ounce.

The king of Dantan, apprehensive that the practice of adulterating the *musk* would injure the commerce of his kingdom, especially as it is also produced, though dearer and in less quality, in Tonquin and Cochinchina, ordered, some time ago, that none of the bags should be sewed, but that the whole of them should be brought open to Boutan, the place of his residence, to be examined and sealed with his own seal. All those I purchased were of this kind. But, notwithstanding all the precautions of the king, the peasants open the bags in a crafty manner, and put into them small pieces of lead, which the merchants tolerate, because lead, as formerly remarked, does not spoil the *musk*, but only augments the weight. In one of my voyages to Patna, I purchased 1,663 bags, which weighed 2,557 ounces and a half; and the *musk*, when taken out of the bags, weighed 452 ounces.—*Les Six Voyages de Jean-Baptiste Tavernier en Turquie, en Perse, et aux Indes*, tom. iv. p. 75.

* The perfumé, says Pallas, which is taken from the musk animals to the north of China, is not so strong as that from China itself; the bladders which contain it are also sold at a very low price. We frequently meet with the musk in

the mountains of Kouznetzk, near the lake Teletzkoi: most are taken in winter; they set snares and traps in the opening of the hedges, formed between the rocks and the steps of the mountains, where these animals seek their food. Their skins are used by travellers for common furs: they sew them like the skins of roe-deer; and, when they are tanned, they are much softer than the skins of other animals of the same country. The musks are also abundant in the mountainous countries beyond the Jenessy: the male sells for thirty or forty sous, on account of its bladder, while hardly ten sous are given for a female with her skin. The prepared skins do not sell for more than ten sous each.

The flesh of these animals is eaten, and the young ones are said to be tender and well tasted.

W.

Plate 281

A. Bell Sculp^t.

CABIAI.

THE CABIAI, OR THICK-NOSED TAPIR*.

THIS animal was never seen in Europe, till the duke de Bouillon had a young one trans-

* CHARACTER SPECIFICUS.

Cavia Capybara. C. ecaudata, plantis tridactylis palmatis. — *Linn. Syst. Nat. Gmel.* i. p. 123. — *Schreb.* iv. p. 620, pl. 174. — *Pall. Spic. Zool.* ii. p. 18.

Sus Hydrochærus. S. plantis tridactylis, cauda nulla. — *Linn. Syst. Nat.* p. 103.

Hydrochærus Capybara. H. dentibus primoribus utrinque duobus. — *Erxleb. Mamm.* p. 193.

Hydrochærus. — *Briss. Quadr.* p. 117.

Capybara Brasiliensibus. — *Marcgr. Bras.* p. 230. — *Jonst. Quadr.* pl. 60. — *Ray's Quadr.* p. 126.

Le Cabiai. — *Buff. Hist. Nat. par Sonn.* xxxi. p. 239, pl. 22.

Thick-nosed Tapir. — *Penn. Synops.* p. 83.

Capybara. — *Penn. Hist. Quadr.* ii. p. 88. — *Shaw's Gen. Zool.* ii. p. 21, pl. 127.

HABITAT

in America australi ad fluvios majores, gregarius atque nocturnus. *W.*

The thick-nosed tapir has the fore-hoofs divided into four, and the hind-hoofs into three, a very large and thick head and nose, small rounded ears, and large black eyes. The upper jaw

mitted to him from America. As this prince is exceedingly curious with regard to foreign animals, he has sometimes done me the honour of inviting me to examine them, and has even been kind enough to present me with several species. The animal under consideration was killed by the coldness of the climate before it had acquired its full growth. It is not a hog, as has been alleged by naturalists and travellers; for it has only some slight relations to the hog, and differs from him in some remarkable characters. The cabiai never exceeds the size of a hog of eighteen months old. Its head is shorter, and its mouth less. Its feet are also very different from those of the hog; for its toes are connected by membranes. It has larger eyes and shorter ears. In dispositions and manners, it differs not less from the hog, than in the structure of its parts. It lives much in the water, where it swims like an otter, catches fishes with its mouth and feet, and eats them on the banks. It likewise eats grain, fruits, and sugar canes. As its feet are long and broad, it often sits on the hind ones. Instead of the grunting of a hog, its cry rather resembles

is longer than the lower. There are two strong and great cutting teeth in each jaw; eight grinders in each jaw, and each of these grinders form on their surface seemingly three teeth, each flat at their ends. The legs are short, and the toes long, connected near their bottoms by a small web; their ends are guarded by a small hoof. It has no tail. The hair on the body is short, rough, and brown. On the nose there are long and hard whiskers. It grows to the size of a hog of two years old. — *Pennant's Synops. of Quad*. p. 83.

the braying of an ass. It seldom walks but in the night, and then generally in company, without removing far from the margin of the water. As it runs badly, on account of the length of its feet, and the shortness of its legs, its safety consists not in flight. To escape the hunters, it plunges into the water, swims to a great distance, and remains so long concealed that they lose all hopes of getting another view of it. The flesh of it is fat and tender; but, like that of the otter, it has rather the taste of bad fish than of good flesh. It has been remarked, however, that its head is pretty good, which corresponds with what is said of the beaver, that the flesh of its anterior parts is well tasted, while that of the posterior parts has the taste of fish. The cabiai is of a gentle and peaceable disposition; it neither quarrels nor does mischief to other animals. It is easily tamed, obeys the voice, and follows spontaneously those with whom it is acquainted, and who treat it kindly. At Paris, it was fed with barley, salads, and fruits, and continued in good condition during the warm season. From the great number of paps, it appears, that the female is very prolific *. We are ignorant of the times of gestation and growth, and consequently of the duration of its life. Our colonists at Cayenne might inform us with regard to these articles; for this animal is pretty common in Guiana, as well as in Brasil, the country of

* There are twelve paps, six on each side, four on the belly and two on the breast. *W.*

the Amazons, and other low lands of South America.

M. de la Borde writes us, that it is very common in Guiana, and still more so in the neighbourhood of the Amazon river, where the fishes are very numerous. He remarks, that these animals go always in pairs, a male and a female; and that the largest of them weigh about a hundred pounds. They fly from the abodes of men, never leave the banks of rivers, and, when they perceive any person, they take to the water, without diving like the otters, but swimming like the hogs. Sometimes, however, they go to the bottom, and continue there a considerable time. They are often taken when young, and brought up in the houses, where they easily accustom themselves to eat bread, millet, and potherbs, though, in a state of nature, they live chiefly on fishes. The females bring forth only one young at a time. They are by no means dangerous; for they never attack either men or dogs. Their flesh is white, tender, and well tasted. This last fact seems to contradict what is said by other travellers, that the flesh of the cabiai has rather the taste of bad fish, than of good meat. However, the flesh of the cabiai, when it lives on fish, may have this bad taste, and, when fed with bread or grain, it may be very good *.

* Sonnini tells us, that he never ate the flesh of the domesticated cabiai, because these animals were seldom reared when he was at Cayenne; but in the interior of the country he was often obliged to be content with it, and says that it is bad

As we had this animal alive in Paris, and kept it a long time, I am persuaded that it might be propagated in our climate. I mentioned above, p. 308, that it was killed by the cold. But I have since been informed, that it endured the winter's cold very well; but, as it was shut up in a garret, it threw itself down from the window, and fell into a vessel full of water, where it was drowned; which would not have happened, if it had not been hurt in the fall upon the edge of the vessel.

food, having an oily, rank taste, like other quadrupeds that live on fish. *W.*

THE PORCUPINE*.

THE name given to this animal in most European languages leads to the notion that it is a hog covered with bristles, though it has no re-

* HYSTRIX.

CHARACTER GENERICUS.

Dentes primores duo, oblique scissi.
Molares octo.
Digiti pedum, 4, 5.
Corpus spinis pilisque tectum.

CHARACTER SPECIFICUS.

HYSTRIX CRISTATA. H. palmis tetradactylis, plantis pentadactylis, capite cristato, cauda abbreviata.—*Linn. Syst. Nat. Gmel.* i. p. 118.—*Schreb.* iv. p. 599, pl. 167.—*Erxleb. Mamm.* p. 340.

Hystrix capite cristato.—*Briss. Quadr.* p. 125.

Histrix orientalis cristata.—*Seba, Mus.* i. p. 79, pl. 50, fig. 1, bona.

HYSTRIX.—*Gesn. Quadr.* p. 563, fig. bona.—*Aldrov. Dig.* p. 471, fig. p. 474.—*Jonst. Quadr.* p. 163, t. 68.—*Raii. Quadr.* p. 206.

STACHELSCHWEIN.—*Riding. Kl. Th.* pl. 90.

LE PORC-EPIC.—*Buff. Hist. Nat. par Sonn.* xxxi. p. 246, pl. 23.

A Bell Sculp.t

PORCUPINE.

Plate 283

A. Bell Sculpt.

PORCUPINE.

semblance to the hog but in the grunting noise it makes. It differs from the hog as much as any other quadruped, both in figure and internal structure. Instead of a long head, furnished with long ears, armed with tusks, and terminated by a snout; instead of cloven feet, covered with hoofs, like the hog; the porcupine has a short head, like the beaver, two large cutting teeth in each jaw, no tusks or canine teeth, the upper lip divided like that of the hare, round flat ears,

CRESTED PORCUPINE.—*Penn. Hist. Quadr.* ii. p. 122.
COMMON PORCUPINE.—*Shaw's Gen. Zool.* ii. p. 1, pl. 122.

HABITAT

in omni Africa, India, Persia, Palæstina: in Italia atque Hispania exoticæ originis.

W.

The porcupine has two cutting teeth in each jaw; the body is covered with long, hard, and sharp quills, and the upper lip is divided. The crested porcupine has a long crest on the top of the head, reclining backward, and formed of stiff bristles. The body is covered with long quills; those on the hind part of the body being nine inches in length, very sharp at the ends, and varied with black and white. Between the quills are a few hairs. The head, belly, and legs, are covered with strong bristles, terminated with soft hair of a dusky colour. The whiskers are long, and the ears are like the human. It has four toes before, and five behind. The tail is short, and covered with quills. The length, from nose to tail, is two feet, and that of the tail four inches.—*Penn. Synops. Quadr.* p. 262.

In Greek and Latin, *Hystrix*; in Arabic, *Tzur-ban*, according to Dr. Shaw; in German, *Stachelschwein*; in Italian, *Porco spinoso*; in Spanish, *Puerco-espino*; in French, *Porc-epic*.

and feet armed with claws. Instead of a large stomach with an appendix shaped like a cowl, which, in the hog, seems to form the shade between the ruminating and other quadrupeds, the porcupine has only a simple stomach and a large cæcum. The parts of generation are not apparent, as in the boar; and the testicles are hid in the groins. From these characters, joined to the short tail, the long whiskers, and the divided lip, we may conclude that the porcupine makes a nearer approach to the hare or the beaver than to the hog. The hedgehog, which, like the porcupine, is armed with prickles, has a greater resemblance to the hog; for its muzzle is long, and terminates in a kind of snout. But, all these resemblances being slight, and the differences conspicuous, the porcupine unquestionably constitutes a particular species, totally distinct from that of the hedgehog, the beaver, the hare, or any other animal to which fancy may compare it.

Travellers and naturalists have attributed to the porcupine the faculty of darting its quills to a distance, and with such force as to inflict deep wounds: they have likewise said, that the quills, when separated from the body of the animal, possess the extraordinary power of penetrating, by their own proper exertion, deeper into the flesh, as soon as their points have entered. This last fact is purely imaginary, and the first is equally false as the second. The error seems to have originated from this circumstance, that the

porcupine, when irritated, erects and moves his quills; and, as some of them are attached to the skin by a delicate pedicle only, they easily fall off. We have examined living porcupines, and, though violently agitated, we never saw them discharge their quills like darts. It is not a little surprising, therefore, that the gravest authors, both ancient * and modern †, as well as the most sensible travellers ‡, should join in giving their suffrages to a falsehood. Some of them tell us, that they themselves have been wounded by these darts: others affirm, that the quills are discharged with such violence as to

* Arist. Hist. Anim. lib. ix. cap 39; Plin. Hist. Nat. lib. viii. cap. 53; Oppian. de Venatione.

† Those quills, say the anatomists of the Academy of Sciences, which were strongest and shortest, easily parted from the skin, being less firmly attached to it than the others. These are likewise the quills which the porcupines dart against the hunters, by shaking their skin as dogs do when they come out of the water. Claudian, in the same manner, remarks, that the porcupine is himself the bow, the quiver, and the arrow, which he employs against the hunters.—*Mem. pour Servir a l'Hist des Animaux*, tom iii. p. 114. *Note*, Fable is the province of the poet; and therefore Claudian merits no reproach. But the anatomists of the academy should not have adopted this fable, which they seem to have done, for no other purpose than that of quoting Claudian; for, from their own account, it appears that the porcupine does not dart his quills to a distance, but that they only fall off when he shakes himself. *Wormius, Mus. Wormian*, p. 235; *Wotton*, p. 30; *Aldrov. de Quad. Digit.* p. 473; and several other respectable writers, have adopted this error.

‡ Tavernier, tom. ii. p. 20; Kolbe, tom. iii. p. 46; Barbot, Hist. Gen. des Voyages, tom. iv. p. 237.

pierce a plank at the distance of several paces *. The marvellous always augments and gathers force in proportion to the number of heads through which it passes. Truth, on the contrary, loses in performing the same route. Notwithstanding the absolute negative I have stamped on these two fictions, I am persuaded that it will still be repeated by a thousand future writers, that the porcupine darts his quills, and that these quills, when separated from the animal, penetrate deeper, by their own proper exertion, into the bodies which they have once entered †.

* When the porcupine is enraged, he darts his quills, which are sometimes two spans in length, with such rapidity and force, against men and other animals, that they will pierce a plank of wood. — *Voyage en Guinée, par Bosman*, p. 253.

† From this group of credulous travellers, we must except Dr. Shaw. "Of the many porcupines which I have seen in Africa, I never knew any of them, though very much provoked, that could dart their quills. Their usual method of defence is, to recline themselves on one side, and, upon the enemy's near approach, to rise up quickly, and gore him with the erected prickles upon the other. — *Shaw's Travels*, p. 176. P. Vincent Marie by no means asserts that the porcupine darts his quills: he only says, that this animal, when he meets with serpents, against whom he carries on a perpetual war, rolls himself up like a ball, concealing his head and feet, and then rolls upon, and kills them with his bristles, without running any risk of being wounded. He adds, what we believe to be true, that, in the stomach of the porcupine, different kinds of bezoar are formed. Some of these are only a mass of roots enveloped with a crust; others, which are smaller, seem to be composed of pieces of straw and sand; and the

The porcupine, though originally a native of the warmest climates of Africa and India, can exist and multiply in colder countries, such as Persia, Spain, and Italy. Agricola remarks, that the porcupine was not transported into Europe long before his time. It is found in Spain, and more commonly in Italy, particularly in the Apennine mountains in the environs of Rome. It was from this last place that M. Mauduit, who, stimulated by his love of natural history, sent us the porcupine which M. Daubenton has described. We have given the figure of this Italian porcupine, as well as that of India. The slight differences between them depend on the climate, or perhaps they are only individual varieties.

Aristotle, Pliny, and all the naturalists, tell us, that the porcupine, like the bear, conceals itself during the winter, and brings forth in thirty days. These facts we have not been able to ascertain; and it is singular, that, in Italy, where the animal is common, and where, at all periods, there have been learned philosophers and acute observers, no man has ever written its history. On this subject, as well as on many others, Aldrovandus has only copied Gesner; and the gentlemen of the academy, who have described and

smallest kind, which exceed not the size of a nut, appear to be real petrifactions. We have no doubt as to the truth of these facts; for we found a bezoar of the first kind, or an ægagropilus, in the stomach of a porcupine which was sent to us from Italy.

dissected eight porcupines, say little or nothing concerning their economy and manners. We only learn from the testimony of travellers, and of those who keep the porcupine in menageries, that, in a domestic state, it is neither wild nor ferocious, but only anxious for liberty; and that, by the assistance of its fore teeth, which are strong and sharp, like those of the beaver, it cuts wood, and pierces the door of its cage * †. We

* There are porcupines in Guinea. They grow to the height of two, or two and a half feet, and their teeth are so sharp and strong, that no wood can resist them. I put one into a barrel, imagining that it was sufficiently secured: but, in one night, it gnawed through the wood, and made its escape. — *Voyage de Bosman*, p. 253.

† We learn from the observations of M. Turin, printed in the Journal de Physique for March 1778, that the porcupine dislikes the light of the sun, but feels a great desire to leave his cage as soon as the twilight begins: he sleeps part of the day.

The same observer kept two porcupines, a male and a female, at the Chateau of Glaye, where the female brought forth two young ones on the first of May, 1777. Upon opening their cage, he found one of the young lying dead, the other very lively and moving about as far as the umbilical cord, which was still attached to the mother, would permit it. It often took its fore-feet between its teeth, and pulled at them: by which means, says M. Turin, it divided the five toes, and a part of one of the fore-legs. The cage was then closed, and, half an hour after, the navel string had separated and disappeared.

The male seems to be more careful of the young than the female; the little one always sleeping on his neck, at least when it is not sucking the mother. The porcupines always sleep on their belly, which does not interfere with the suck-

likewise know, that it is easily fed upon crumbs of bread, cheese, and fruits; that, in a state of liberty, it lives upon roots and wild seeds; that, when it gets admission to a garden, it makes great havoc, and devours all kinds of pot-herbs with avidity; that, like most other animals, it becomes fat about the end of summer; and that its flesh, though somewhat insipid, is not bad to eat.

By examining the form, substance, and organization of the quills, we easily perceive that they are tubes, and only want vanes to be real feathers. From this circumstance, the porcupine constitutes the shade between quadrupeds and birds. The quills, particularly those near the tail, make a noise by striking each other when the animal walks. He can elevate or depress his quills, as the peacock raises or lowers the feathers of his tail. Hence the muscular part

ling of the young, as the teats are placed on the sides. The young are born with spines of the same colour as the full grown porcupines: the quills upon that of which M. Turin is speaking, were twenty-two lines long. This little animal, though just born, erected its spines like its parents, and, when taken up, shook them so as to tickle the palm of the hand very sensibly.

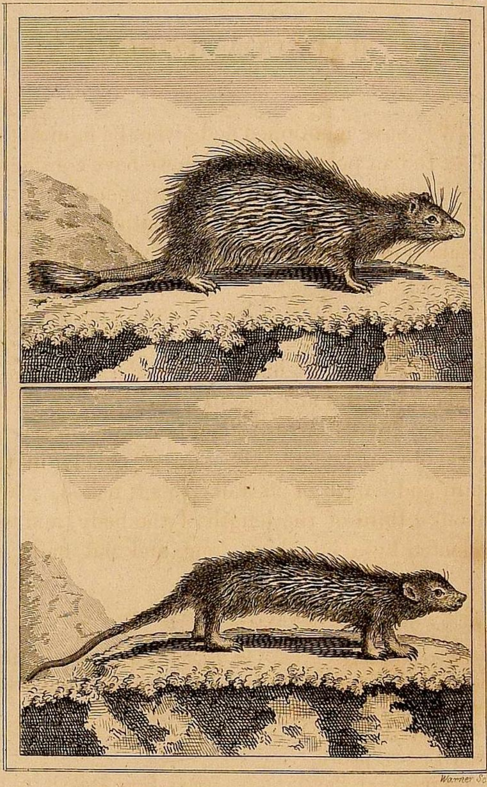
When the porcupines left their lodges, if their spines were not erected, they could pass under any thing which was raised five inches above the surface of the ground. It does not appear that they are torpid in the winter. Those kept by M. de Turin were fed all the year round, and did not sleep more at one season than another: crumb of bread, fruit, and kitchen-garden roots, were their common food: they never drank. *W.*

of the skin is capable of acting with force, and its structure is nearly the same with that of some birds. We have marked these relations, though not very apparent. It is always fixing one point in Nature, who often escapes our researches, and seems, in her productions, to sport with those who wish to cultivate her acquaintance.

No. 218.

THE CORMORANT.

Malacca Porcupine.



Warner Sc.

Long-tailed Coendou.

THE MALACCA PORCUPINE*.

WE have mentioned and given the figure of an East Indian porcupine, which we have considered as a variety only of the Italian species; but in the southern countries of our continent, and particularly at Malacca, there exists another species of porcupine, which was drawn from the life by M. Aubry, curé of Saint Louis, and is figured in this place. We have also seen one alive, exactly like it, in the hands of a dealer in animals, who exhibited it at Paris, in October, 1777. This species differs from the common kind in several very obvious characters, and especially in the form and length of its tail: this is naked, scaly, about a third of the length of the body, and terminated by a bunch of long and flat hairs, or

* CHARACTER SPECIFICUS.

HYSTRIX FASCICULATA. H. palmis tetradactylis, plantis pentadactylis, cauda mediocri apice setis complanatis fasciculato. — *Shaw's Gen. Zool.*

LE PORC-EPIC DE MALACCA. — *Buff. Hist. Nat. par Sonn.* xxxi. p. 263, pl. 24.

BRUSH-TAILED PORCUPINE. — *Shaw's Gen. Zool.* ii. p. 11, pl. 124.

HABITAT

in Malacca *W.*

rather of little white straps, like shreds of parchment: the body measures fifteen or sixteen inches. The Malacca porcupine is less than the European kind; its head, nevertheless, is longer, and the snout, which is covered by a thick skin, is furnished with whiskers of five or six inches in length. The eyes are small and black, the ears smooth, naked, and round: there are four toes united to the fore-feet by a membrane, with only a tubercle in place of a fifth: there are five toes on the hind-feet, united in a similar manner by a membrane, but smaller than that on the fore-feet. The legs are covered with blackish hairs. All the under parts of the body are white: the flanks and the upper part of the body are studded with quills, shorter than those of the common porcupine, but of a peculiar form, being flattish, and channelled with a longitudinal furrow: these quills are white at the point and black in the middle, and several are black above and white below: from this mixture there results a varying cast of black and white over the whole body of the animal.

This species, like others of its genus (which Nature has armed to act upon the defensive only), possesses a kind of instinctive fierceness: when approached, it stamps with its feet, and appears to inflate itself, raising and shaking its quills. It sleeps much in the day, and is active only by night. It eats in a sitting posture, holding apples and other fruits between its paws, which it peels with its teeth: it is particularly pleased with stone fruits, especially the apricot.

Plate 285

A. Bell Sculp.t

COENDOU

THE COENDOU, OR BRASILIAN PORCUPINE *.

IN every article we have treated of, there are more errors to detect than truths to relate. The source of these errors is to be derived from

* CHARACTER SPECIFICUS.

HYSTRIX PREHENSILIS. H. pedibus tetradactylis, cauda elongata prehensili seminuda. — *Linn. Syst. Nat. Gmel.* i. p. 118. — *Schreb.* iv. p. 603, pl. 168. — *Erxleb. Mamm.* p. 342.

Hystrix (Americanus) cauda longissima tenui, medietate extrema aculeorum experte. — *Briss. Quadr.* p. 129.

Hystrix minor Leucophæus. — *Barr. Fr. Equin.* p. 153.

HYSTRIX AMERICANUS. — *Raii Synops. Quadr.* p. 208.

CUANDU. — *Pis. Ind.* p. 99.

LE COENDOU. — *Buff. Hist. Nat. par Sonn.* xxxi. p. 266, pl. 20, fig. 2.

BRASILIAN PORCUPINE. — *Penn. Hist. Quadr.* ii. p. 124, pl. 73.

PREHENSILE PORCUPINE. — *Shaw's Gen. Zool.* ii. p. 7, pl. 123.

HABITAT

in Mexico, Brasilia; non in India orientali.

W.

The Brasilian porcupine has a short blunt nose, and long white whiskers. Beneath the nose is a bed of small spines,

this circumstance, that, of late, the history of animals has been solely composed by men who are prejudiced with methodical arrangements, and who mistake their trifling systems for the genuine registers of Nature. No animals belonging to the warm climates of the Old Continent exist in America; neither are any of the South American animals to be found under the Torrid Zone of Africa and Asia. The porcupine, as formerly remarked, is an original inhabitant of the warm countries of the Old World; and, having never been found in the New, his name has been transferred to such animals as resembled him, and particularly that now under consideration. On the other hand, the coendou of America has been transported to the East Indies; and Piso, who probably knew not the porcupine, made Bontius *, who treats only of animals belonging to the south of Asia, engrave the

The top of the head, back, sides, and base of the tail, are covered with spines. The longest on the lower part of the back and tail are three inches in length, very sharp, white, and barred near their points with black. They adhere closely to the skin, which is quite naked between them. They are shorter and weaker as they approach the belly; and on the breast, belly, and lower part of the legs, they are converted into dark brown bristles. The feet are divided into four toes, and the claws are very long. On the place of the thumb, there is a great protuberance. The tail is eighteen inches long, slender, and taper towards the end; the last ten inches of it is almost naked, having only a few hairs on it, and has, for that length, a strong prehensile quality. — *Pennant's Synops. Quadr.* p. 264.

* Jac. Bontii, Hist. Indiæ Orient. p. 54.

American coendou under the name of the true porcupine; so that, at first sight, we would be tempted to think that this animal existed equally in America and in Asia. With a little attention, however, it is easy to perceive, that Piso, who, in this article, as well as in most parts of his work, is but the plagiary of Marcgrave, has not only copied Marcgrave's figure of the coendou into his History of Brasil, but likewise engraved it again for Bontius's work, which he digested and published. Hence, though we have the figure of the coendou in Bontius, we must not conclude that it exists in Java, or in any other part of the East Indies, nor take this figure for that of the porcupine, between which and the coendou there is no similarity, except that both have quills or spines.

It is to Ximenes, and afterwards to Hernandez, that we owe our first knowledge of this animal, which they have pointed out under the Mexican name of *hoitztlacuatzin*: the *tlacuatzin* is the opossum; and *hoitztlacuatzin* should be translated the *bristly*, or *spinous opossum*. This denomination has been ill applied; for these animals have very little resemblance. Marcgrave has not adopted this Mexican name, but calls the animal by its Brasilian name, *cuandu*. Marcgrave, however, ought to have perceived, that his Brasilian cuandu was the same animal with the hoitztlacuatzin of Mexico, especially as his figure and description correspond very well with those of Hernandez, and as Laët, the editor and commentator of Marcgrave, says, in express

terms *, that the spinous tlacuatzin of Ximenes, and the cuandu, are probably the same animal. From the few notices to be collected from travellers, it appears that there are two varieties of these animals, which the naturalists have copied from Piso † into their catalogues, as two distinct species, namely, the great and the small cuandu ‡. But the error or the negligence of Piso is apparent; for though he gives these coendous in two separate articles, and seems to regard them as distinct species, he represents both by the same figure: hence we are entitled to pronounce them to be the same animal. There are also some naturalists who not only make two species of the great and small coendou, but have separated them from the hoitztlacuatzin, and given the whole three as different animals; I acknowledge, indeed, that, though the coendou and hoitztlacuatzin are probably the same animal,

* Videtur esse idem animal aut saltem simile quod Fr. Ximenès describit sub nomine Tlaquatzin spinosi.—*De Laët, Annotatio in* cap. 9, lib. vi.—*Marcgrave,* p. 233.

† Cuandu major.—*Pison, Hist. Bras.* p. 324, fig. p. 325. Cuandu seu cuandu minor.—*Ibid.* p. 99, fig. *ibid.*

‡ Hystrix longius caudatus, brevioribus aculeis.—*Barrère, Hist. Nat. de la Fr. Equinox. Porc-epic,* p. 153. Hystrix minor. *Leucopheus, Gouandou.*—*Id. ibid.*

Hystrix cauda longissima tenui, medietate extrema aculeorum experte. Hystrix Americanus major. *Le Grand Porc-epic d'Amerique.*—*Briss. Regn. Anim.* p. 130. Hystrix cauda longissima, tenui medietate extrema aculeorum experte. Hystrix Americanus. *Le Porc-epic d'Amerique.*—*Ibid.* p. 129. Hystrix aculeis apparentibus, cauda brevi et crassa. Hystrix novæ Hispaniæ. *Le Porc-epic de la Nouvelle Espagne.*—*Ibid.* p. 127.

their identity is not so certain as that of the great and small coendou.

However this matter stands, the coendou is not the porcupine. The former is much smaller. His head and muzzle are proportionally shorter. He has no plume or crest on his head, and his upper lip is not divided. He has a long tail; but that of the porcupine is very short. He is rather a carnivorous than a frugivorous animal; for he endeavours to surprise birds, small quadrupeds, and poultry *, while the porcupine lives upon pot-herbs, roots, and fruit. Like the hedgehog, he sleeps during the day, and moves about in the night. He climbs trees †, and suspends himself by the tail upon the branches. He may be tamed. He commonly lives in elevated places ‡; and he is found through the

* This fact, which is asserted by Marcgrave and Piso, is not certain; for Hernandez, on the contrary, says, that the hoitztlacuatzin feeds upon fruits.

† Scandit arbores sed tardo gressu, quia pollice caret; descendens autem caudam circumvolvit ne labatur, ādmodum enim metuit lapsum, nec salire potest. — *Marcgrav. Hist. Nat. Bras.* p. 233. We spied a porcupine upon a small tree, which we cut down for the pleasure of seeing the animal fall. He is very fat, and the natives eat his flesh. — *Voyage de la Hontan*, tom. i. p. 82.

‡ Carnem habet bonam et pergratam; nam assatam sæpe comedi, et ab incolis valde æstimatur. — *Marcgrave*, p. 233. His flesh is very good, and it is scalded, like that of the hog. But the savage women previously pull off all the quills from his back, of which they make various trinkets. . . . After being scalded, washed, and roasted on a spit, it is of equal value with a pig. — *Descript. par l'Amerique par Denis*, tom. ii. p. 324.

whole continent of America, from Brasil and Guiana, as far as Louisiana and the southern parts of Canada. But the porcupine is confined to the warm regions of the Old Continent.

By conferring the name of porcupine upon the coendous, the same powers have also been ascribed to him, particularly that of shooting his quills. It is astonishing, that naturalists and voyagers should agree in this fact, and that Piso, who ought to have been less superstitious, because he was a physician, should gravely tell us, that the quills of the coendou pierce the flesh by their own proper force, and penetrate into the bowels of an animal. Though these facts be evidently absurd, Ray is the first author who denied them. But how many absurdities have been exposed by men of sense, which are still daily affirmed by other men, who believe they possess a greater portion of understanding?

In Guiana there are two species of coendous. The largest weighs from twelve to fifteen pounds. They keep always on the highest trees. They eat nothing during the day. Their odour is very strong, and felt at a great distance. The females bring forth their young, to the number of two, in the holes of trees. They feed on the leaves of these trees, and are not very common. Their flesh is extremely good; and the Negroes prefer it to that of the paca. According to M. de la Borde, the two species never mix. They are never found in pairs, except in the season of love. At other times, they are solitary; and the females never quit the tree in which they

have brought forth. These animals are apt to bite; but their bite is neither strong nor dangerous.

The individuals of the small species weigh about six pounds. They are not more numerous than the others. The tigers are deadly foes to the coendous; and they never appear on the ground during the day.

THE LONG-TAILED COENDOU.

ANOTHER quilled animal, unknown to us, and larger than the coendou, has been brought from Cayenne to Paris with the collection of M. Malouette, intendant of that colony.

Its body is covered with black and white quills, and its long tail, which distinguishes it from all the other species of its genus, has not the bunch of spines at its end like the other porcupines.

Its tail measures twenty-one lines at the base, from whence it tapers to a point. There are no other quills on the tail than what proceed from the extremity of the body, and which extend to its middle. It is blackish and scaly from the middle to the point, and is, so far, covered with little hairs of a clear brown colour: the rest is scaly, both above and below.

The head of this coendou is more like that of the Malacca porcupine than of any other, however it is shorter. The longest hairs in its whiskers (which are black) measure four inches five lines. The ears are naked and bare, except some spines on the edges; besides, it has no spines so large as the Italian porcupine, and in this character approaches the coendou. The

base and point of these spines are white, and the middle black; thus the white predominates. There are some hairs, two inches and a half long, interposed between the upper quills on the fore and hind-legs.

There is no membrane between the toes of the fore-feet, which are four in number; the hind-feet have five toes, but the thumb is rather the longest: these toes are covered with short brown hairs; the nails are of the same colour, curved and furrowed *.

* This animal is the New Spain porcupine of Hernandez, and the Mexican porcupine of Pennant and of Shaw, who both agree in separating it from the preceding species. The French naturalists, on the coutrary, especially Lacepede and Sonnini, consider it as a mere variety of the Brasilian porcupine, and in this opinion they are supported by the authority of Erxleben and Gmelin, who have ranked it with the hystrix prehensilis. Buffon seems to have considered it as the same species. Pennant observes that it inhabits the mountains of Mexico, lives on summer-fruits, and may be easily tamed. He adds, that the Indians pulverize the quills, and say they are very efficacious in gravelly cases: they also apply them whole to the forehead, where they are said to adhere till full of blood, and then drop off: in this manner they will relieve the most violent head-ach.

W.

THE CANADA PORCUPINE*.

THIS animal has never received a proper name. Placed by Nature in the desert regions of North America, it enjoys an independent

* CHARACTER SPECIFICUS.

Hystrix Dorsata. H. palmis tetradactylis, plantis pentadactylis, dorso solo spinoso.—*Linn. Syst. Nat. Gmel.* i. p. 119.—*Schreb.* iv. pl. 169.

Hystrix (dorsata) palmis tetradactylis, plantis pentadactylis, dorso præcipue spinoso, cauda subabbreviata.—*Shaw's Gen. Zool.* ii. p. 13.

Hystrix Hudsonis. H. aculeis sub pilis occultis, cauda brevi et crassa.—*Briss. Quadr.* p. 128.

Hystrix pilosus Americanus.—*Catesby, Carol. App.* p. 30.

L'Urson.—*Buff. Hist. Nat. par Sonn.* xxxi. p. 281, pl. 25, fig. 1.

Porcupine from Hudson's Bay.—*Edw. Av.* i. p. 52, pl. 52.

Canada Porcupine.—*Penn. Hist. Quadr.* ii. p. 126.—*Shaw's Gen. Zool.* ii. p. 13, pl. 125.

HABITAT

in omni America boreali usque ad fretum Hudsonis, ubi copiosissima. *W.*

The Canada porcupine has short ears hid in the fur. The head, body, legs, and upper part of the tail, are covered with soft, long, dark brown hair. On the upper part of the head, back, body, and tail, there are numbers of sharp, strong quills. The longest are on the back, the least towards the head and sides. The longest are three inches; but all are hid

A. Bell Sculp.t

URSON.

existence, remote from man, from whom it has obtained no denomination, which is the first badge of his empire. Hudson having discovered the land which it inhabits, we shall give it a name which recals that of its first master, and indicates, at the same time, its poignant and bristly nature. Besides, it was necessary to bestow a name upon it, to prevent its being confounded with the porcupine, or the coendou, which it resembles in some characters, but differs so widely from them in all others, that it ought to be regarded as a particular species. It likewise belongs to a northern climate, while the other two are natives of the south.

Edwards, Ellis, and Catesby, have all mentioned this animal. The figures given by the two first authors correspond with ours; and we doubt not but they are the same species. We are even tempted to believe, that the animal described and engraved by Seba *, under the name of *a singular East India porcupine*, and which was afterwards pointed out by Klein †. Bris-

in the hair. Intermixed are some stiff straggling hairs, three inches longer than the rest, and tipt with dirty white. The under side of the tail is white. There are four toes on the fore-feet, five behind, each armed with long claws, hollowed on their under side. The form of the body is exactly that of the beaver, but is not half the size. One which Mr. Banks brought from Newfoundland was about the size of a hare, but more compactly made. The tail was about six inches long.—*Penn. Synops. Quadr.* p. 266.

* Porcus aculeatus sylvestris, sive hystrix orientalis singularis. — *Seba*, vol. i. p. 84, tab. 52, fig. 1.

† Acanthion cauda prolonga acutis pilis horrida, in exitu quasi panniculata.—*Klein de Quad.* p. 67.

son * and Linnæus †, in their methodical catalogues, by the characters given by Seba, might be the same with the animal under question. This would not, as formerly remarked, be the only time that Seba has exhibited American animals as belonging to the East Indies. We cannot, however, be so certain with regard to this animal as we have been with several others. We shall only say, that the resemblances appear to be very great, and the differences but slight; and that, as these animals are little known, the differences may be only individual varieties, or those which distinguish males and females .

The Canada porcupine might be called the *bristly beaver*. It is a native of the same country, is of the same size, and has nearly the same figure. Like the beaver, it has two long, sharp, and strong cutting teeth in each jaw. Independent of its quills, which are short, and almost concealed among the hair, it has, like the beaver, a double fur, the first consisting of long soft hairs, and the second of a down still more soft. When the animal is young, the quills are

* Hystrix cauda longissima, aculeis undique obsita, in extremo panniculata. Hystrix Orientalis. The Indian porcupine. — *Briss. Regn. Anim.* p. 131.

† Hystrix macroura, pedibus pentadactylis, cauda longissima, aculeis clavatis.—*Linn. Syst. Nat.* p. 77.

‡ In this instance Buffon is certainly mistaken, as the figure given by Seba belongs to a distinct species, described by Linnæus in the Systema Naturæ under the name of *hystrix macroura*.

proportionally larger and more apparent, and the hairs are shorter and thinner than in the adults.

This animal avoids all kinds of moisture. He retires and deposits his excrements under the roots of hollow trees *. He sleeps much, and feeds chiefly on the bark of the juniper bushes. In winter, the snow serves him for drink; and, in summer, he drinks water, which he laps like a dog. The Savages eat his flesh, and clothe themselves with his fur, after depriving it of the quills and bristles †.

* See Edwards's Hist. of Birds, p. 52.

† According to Pennant, the Canada porcupine makes its nest under the roots of great trees, and will also climb among the boughs, which the Indians cut down when one is in them, and kill the animal by striking it over the nose. They are very plentiful near Hudson's Bay, and many of the trading Indians depend on their flesh for food, esteeming it both wholesome and palatable. They feed no wild fruits and bark of trees, especially juniper; eat snow in winter, and drink water in summer, but avoid going into it. When they cannot avoid their pursuer, they will sidle towards him, in order to touch him with their quills, which seem but weak weapons of defence; for, on stroaking the hair, they will come out of the skin, sticking to the hand. The Indians pass them through their noses and ears, to make holes for the placing of ear-rings and other finery; they also trim the edges of their deer-skin habits with fringes made of the quills, or cover with them their bark boxes.—*Penn. Hist. Quadr.* ii. p. 127. *W.*

THE TANREC AND THE TENDRAC, OR ASIATIC HEDGEHOG*.

THE *tanrecs*, or *tendracs*, are small East Indian animals, which have some resemblance to our hedgehog, but differ so much from it as

* CHARACTER SPECIFICUS †.

Erinaceus Setosus. E. auriculis brevioribus, occipite satis tecto, cauda brevissima spinosa.—*Linn. Syst. Nat. Gmel.* i. p. 117.—*Schreb.* iii. pl. 164.

Tendrac.—*Buffon.*

Erinaceous Ecaudatus. E. cauda nulla, rostro longissimo acuto.—*Linn. Syst. Nat. Gmel.* i. p. 117.—*Schreb.* iii. pl. 165.

Erinaceous Madagascariensis. E. spinoso-setosus, fasciis longitudinalibus albis nigrisque, rostro longo acuto.—*Shaw's Gen. Zool.* i. p. 549.

Le petit Tandrek de Madagascar.—*Sonn. Voy.* ii. p. 146, pl. 93.

Le Tanrec et Le Tendrac.—*Buff. Hist. Nat. par Sonn.* xxxi. p. 283, pl. 25, fig. 2, 3, et pl. 26.

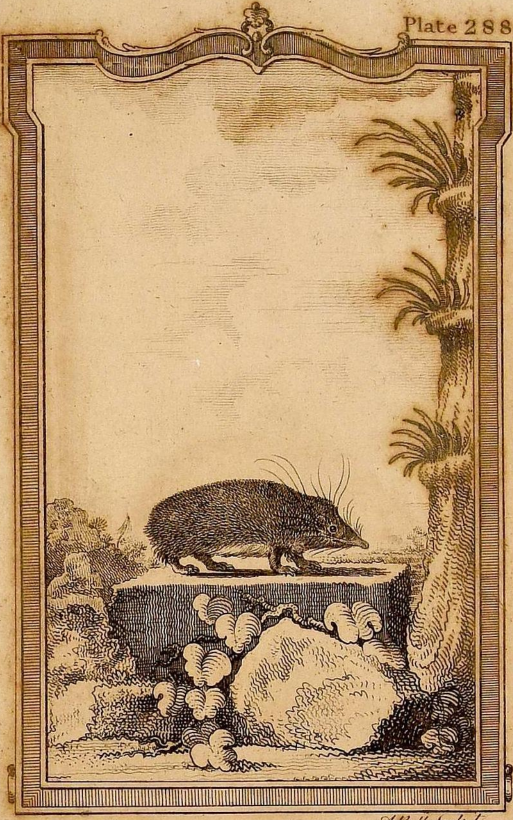
† For the generic character, see Hedgehog.

Gmelin has formed two distinct species of these animals, but they are only varieties of each other, and are very properly united both by Pennant and Dr. Shaw. *W.*

Plate 287

TANREC.

Plate 288



A. Bell Sculp.t

TENDRAC.

to constitute a distinct species. This is apparent, independent of inspection or comparison; for they never roll themselves up into a ball, like the hedgehog; and besides, the tanrecs are found in Madagascar, where there are also hedgehogs of the same kind with ours, which bear not the name of *tanrec*, but are called *sora* *.

There seems to be two species, or perhaps two races of tanrecs: the first, which is nearly as large as our hedgehog, has a muzzle proportionally longer than the second; its ears are also

ASIATIC HEDGEHOG.—*Penn. Hist. Quadr.* ii. p. 236.
STRIPED HEDGEHOG.—*Shaw's Gen. Zool.* i. p. 549.

HABITAT

in Madagascar. *W.*

The *tendrac*, or Asiatic hedgehog, with a long slender nose, short rounded ears, and short legs. The upper part of the body is covered with short spines, white, and marked cross the middle with rust colour. The face, throat, belly, buttocks, and legs, are thinly covered with whitish, fine, but hard hair. The tail is very short, and covered with spines. About the nose there are some hairs above two inches long. It is of the size of a mole.

The other, or the *tanrec*, is rather larger. It is covered with spines only on the top and hind part of the head, the top and sides of the neck, and the shoulders; the longest were on the upper part of the neck, and stood erect. The rest of the body was covered with yellowish bristles, among which were intermixed some that were black, and much longer than the others. Each of these animals, which are varieties of the same species, had five toes on each foot.—*Penn. Synops. Quadr.* p. 317.

* Voyage a Madagascar, par Flacourt, p. 152.

more apparent, and it has fewer bristles than the other, to which we have given the name of *tendrac*, to distinguish it from the first. This tendrac is not larger than a large rat. Its muzzle and ears are shorter than those of the tanrec, which last is covered with smaller bristles, but equally numerous with those of the hedgehog. The tendrac, on the contrary, has no spines but on the head, the neck, and the withers, the rest of the body being covered with coarse hair, like hogs' bristles.

These small animals, which have short legs, move very slowly. They grunt and wallow in the mire like hogs*. They are fond of water, in which they dwell longer than upon land. They are caught in salt water, in canals, and in small gulfs of the sea. They are very ardent in their amours, and multiply greatly †. They dig holes in the ground, into which they retire, and lie in a torpid state during several months. In this state, their hair falls off, which grows again after they awake. They are generally very fat; and though their flesh be insipid and reedy, the Indians eat it with pleasure.

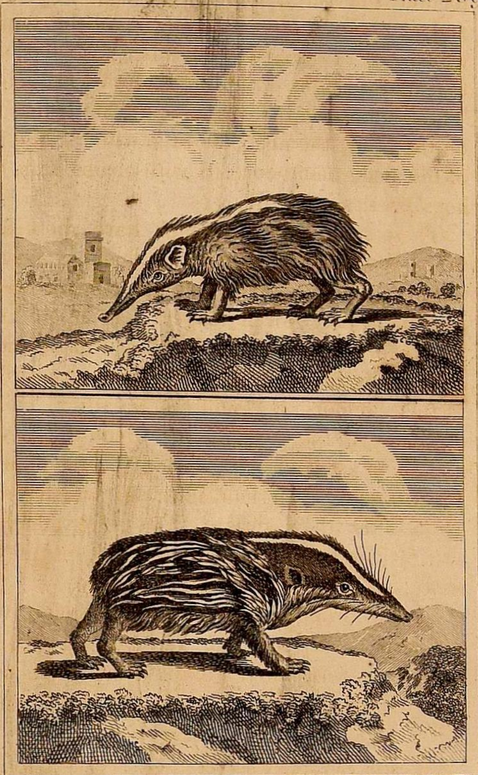
M. de Brugniers, the king's physician, who was sent to the southern continent in 1772, to make discoveries in natural history, gave us a little animal, which we found to be a young

* Recueil des Voyages qui ont servir à l'Etablissement de la Compagnie des Indes de Hollande, tom. i. p. 412.

† Relation de Fr. Cauche, p. 127; Voyage de la Compagnie des Indes de Hollande, p. 412.

YOUNG TANREC.

Plate 289



Warner Sc.

LITTLE TENDRAC.

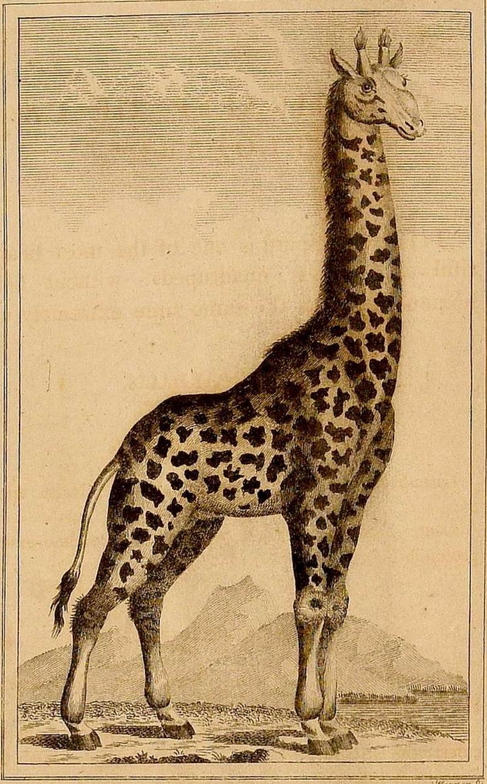
tanrec. We have figured this young tanrec of the natural size, and it differs from the other only in its smallness and by three whitish bands, which we suppose to be the habit of the animal. The first of these bands extends from the snout along the head, on the neck, and on the spine of the back ; the two other bands are on the flanks; and as all the other characters, especially the shape of the snout, the long hairs scattered on the body, the black colour of the spines, &c., are found in this little tenrac similar to the large ones, we have considered it as forming but one and the same species.

We have also figured a very small tendrac which was sent from the Isle of France by M. Poivre to M. Aubry, curé of Saint Louis; it is represented of its natural size, and does not appear to us to differ from our tendrac, except by its smallness, and by several white stripes, which seem to form its proper coat. The curé of Saint Louis writes, that it is found at Madagascar, and that the French in that country call it *rat-epic*.

This animal has a very long and pointed snout; its head is covered with a blackish red hair, and the body (which is of the same colour) is covered with yellowish-white spines, that seem joined together in irregular stripes. On the top of the nose we remark a yellowish-white band, that extends to the beginning of the back, and terminates in a point at each end: this white band consists of the same hair as the rest of the body; it is harsh enough, although very fine in comparison to the spines. The under side of the neck

and body is of a yellowish-white, as well as the legs and feet, which are, however, rather mixed with brown. The longest hairs of the whiskers measure eight lines. The feet have each five toes, and, in this little animal, we saw no appearance of tail.

Plate 290



GIRAFFE.

THE GIRAFFE, OR CAMELOPARD*.

THE camelopard is one of the most beautitiful and largest quadrupeds: without being noxious, he is at the same time extremely use-

* CAMELOPARDALIS.

CHARACTER GENERICUS.

Cornua pelle setosa tecta, apice fasciculo pilorum terminata.

Dentes primores inferiores octo, spatulati, extimo externe profunde bilobo.

CHARACTER SPECIFICUS.

CAMELOPARDALIS GIRAFFA.—*Linn. Syst. Nat. Gmel.* i. p. 181.—*Schreb.* v. pl. 255.

Camelopardalis (giraffa) albida, maculis subquadratis fuscoferrugineis, cornibus setosis apice truncatis.—*Shaw's Gen. Zool.* ii. p. 303.

CERVUS CAMELOPARDALIS.—*Linn. Syst. Nat.* xii. p. 92.

Cervus (camelopardalis) cornibus simplicissimis, pedibus anticis longissimis.—*Erxleb. Mamm.* p. 294.

CAMELUS INDICUS.—*Jonst. Quadr.*

CAMELOPARDALIS.—*Plin. Hist. Nat.* viii. c. 18.—*Gesn.*

less. The enormous disproportion of his legs, of which those before are double the length of those behind, prevents him from exercising his powers.

Quadr. p. 160. — *Aldrov. Bisulc.* p. 927, fig. p. 931. — *Ray's Quadr.* p. 90.

GYRAFFA. — *Belon, Obs.* fig. p. 118; fig. p. 119.

LA GIRAFFE. — *Buff. Hist. Nat. par Sonn.* xxxii. p. 1, pl. 1.

CAMELOPARD GIRAFFE. — *Penn. Hist. Quadr.* i. p. 65, pl. 11.

GIRAFFE. — *Shaw's Gen. Zool.* ii. p. 303, pl. 181, and 182 (the head). — *Bew. Quadr.* p. 106.

HABITAT

in regione Sennar inter Ægyptum superiorem et Æthiopiam, in Æthiopia ipsa et Abissinia, rara. *W.*

The camelopard has short straight horns, covered with hair, truncated at the end, and tufted with hair. In the forehead, there is a tubercle about two inches high, resembling a third horn. The height, from the crown of the head to the soles of the fore-feet, is seventeen feet, and that from the top of the rump to the bottom of the hind-feet, only nine: the length of the body is seven, and from the withers to the loins, only six feet. The fore-legs are not longer than the hind-legs; but the shoulders are of a vast length, which give the disproportionate height between the fore and hind parts. The horns are six inches long. The head is like that of a stag. The neck is slender and elegant, and on the upper side there is a short mane. The ears are large, and the tail long, with strong hairs at the end. The colour of the whole animal is a dirty white, marked with large, broad, rusty spots. — *Pennant's Synops. of Quad.* p. 20.

Giraffe, a word derived from *Girnaffa, Siraphah, Zurnaba*, the name of this animal in the Arabian language, which has been adopted by the modern Europeans. *Camelopardalis* in Greek and Latin. Pliny gives the etymology of this compound name. "Camelorum," he remarks, "aliqua similitudo

His body has no stability; he has a staggering gait; and his movements are slow and constrained. When at liberty, he cannot escape from his enemies, nor can he serve man in a domestic state. The species is not numerous, and has always been confined to the deserts of Æthiopia, and to some provinces in the south of Africa and India. As these countries were unknown to the Greeks, Aristotle has made no mention of this animal. Pliny speaks of it, and Oppian describes it in a manner which is by no means ambiguous*. The camelopardalis, this last author remarks, has some resemblance to the camel. Its skin is spotted like that of the panther, and its neck is as long as that of the camel. Its head and ears are small, its feet large, and its legs long, but unequal, those before being much taller than those behind, which are very short, and seem to bring the rump of the animal down to the ground. Upon the head, near the ears, there are two eminences like two small straight horns. Its mouth resembles that of the stag; the teeth are small and white, the eyes brilliant, the tail short, and garnished with black hairs at the point. By adding to this de-

in aliud transfertur animal, *Nabin* Ethiopes vocant. Collo similem equo, pedibus et cruribus bovi, camelo capite; albis maculis rutilum colorem distinguentibus, unde appellata *Camelopardalis*: Dictatoris Cæsaris Circensibus ludis primum visa Romæ; ex eo subinde cernitur, aspectu magis quam feritate conspicua: Quare etiam ovis feræ nomen invenit."—*Hist. Nat.* lib. viii. cap. 18.

* Oppian. de Venat. lib. iii.

scription of Oppian those of Heliodorus and Strabo, we shall have a pretty just idea of the camelopard. The Æthiopian ambassadors, says Heliodorus, brought an animal of the size of a camel, whose skin was marked with lively spots and brilliant colours, and whose posterior parts were much lower than the anterior. The neck, though attached to a pretty large body, was thin; the head, in figure, resembled that of the camel, and, in size, it was not twice as large as that of the ostrich. The eyes appear to be tinged with different colours. The gait of this animal was different from that of all other quadrupeds, which in walking lift their feet diagonally, that is, the right fore-foot with the left hind-foot. But the camelopard ambles naturally, lifting the two right or the two left feet together. It is a gentle creature, and may be conducted at pleasure by a small cord put round its head*. There is, says Strabo, a large animal in Æthiopia, called *camelopardalis*, though it has no resemblance to the panther; for its skin is not spotted in the same manner. The spots of the panther are circular, and those of the camelopard resemble the spots of the fawn or young stag. The posterior parts of its body are much lower than the anterior; so that, at the rump, it is not higher than an ox, and at the shoulders it is higher than a camel. From this disproportion of parts, its motions should not be quick. It is a mild ani-

* Heliodorus, lib. x.

mal, does no mischief, and feeds upon herbs and leaves*.

Belon is the first author who has given a good description of the camelopard. " I saw," says he, " at the castle of Cairo, an animal commonly called *zurnapa*. It was formerly denominated *camelopardalis*, a name compounded of *leopard* and *camel;* for it is variegated with the spots of a leopard, and has a long neck, like the camel. It is a most beautiful creature, as gentle in its dispositions as a sheep, and more amiable than any other wild beast. Its head is nearly similar to that of the stag, except in size. Its horns are blunt, six inches long, and covered with hair; those of the male are longer than those of the female. Both male and female have large ears, like those of a cow, and a black tongue resembling that of an ox. It has no teeth in the upper jaw. The neck is long, straight, and slender. The horns are round and delicate, the legs long and slender, and those behind are so low, that the animal seems to stand on end. Its feet resemble those of an ox. Its tail, which hangs as low as the hock, is round, having hairs three times as gross as those of a horse. The hair on the body is white and red. Its manner of running is similar to that of the camel. When it runs, the two fore-feet move together. It lies on its belly, and has hard protuberances on its breast and thighs, like the

* Strabo, lib. xvi. et xvii.

camel. When standing, it cannot browse the grass without spreading its fore-feet very wide, and even then the operation is performed with great difficulty; for which reason it could not live in the fields, if it were not supplied with the leaves and sprigs of trees *."

The description of Gillius is still better than that of Belon. "I saw," says Gillius, chap. 9, "three giraffes at Cairo. They had two horns of six inches in length, and, on the middle of the front, a protuberance about two inches high, which resembled a third horn. This animal, when he raises his head, is sixteen feet high; the neck alone is seven feet; and the length, from the extremity of the tail to the end of the nose, is twenty-two feet. The fore and hind-legs are nearly of an equal height. But the fore thighs are so disproportionally long, that the back of the animal inclines like the roof of a house. The whole body is marked with large yellow spots, nearly of a square figure. . . . It has cloven feet like the ox. The upper lip protrudes beyond the under. The tail is slender, with hairs at the point. It ruminates and eats herbage, like the ox. Its mane extends from the top of the head along the back. When it walks, its legs and flanks on both sides seem to be alternately lame; and, when it browses herbage or drinks, it is obliged to spread its fore-legs prodigiously wide †."

* Observ. de Belon, p. 118.

† To these early accounts of the giraffe may be added

Gesner quotes Belon for affirming that the horns of the giraffe fall off like those of the fallow deer *. I could never discover this fact in Belon. He only says, in the above passage, that the horns of the giraffe are covered with hair. He makes no other mention of this animal, ex-

the curious observations by Morison †. Speaking of Constantinople, which he visited in January, 1597, he says, "Here be the ruins of a palace upon the very walls of the city, called the palace of Constantinople, wherein I did see an elephant, called *philo*, by the Turks; and another beast newly brought out of Affricke (the mother of monsters), which beast is altogether unknown in our parts, and is called *surnapa*, by the people of Asia, *astanapa* by others, and *giraffa* by the Italians: the picture thereof I remember to have seen in the maps of Mercator; and, because the beast is very rare, I will describe his form as well as I can. His hair is red coloured, with many black and white spots; I could scarce reach with the point of my fingers to the hinder part of his back, which grew higher and higher towards his fore-shoulder, and his neck was thin and some three ells long, so as he easily turned his head in a moment to any part or corner of the room, wherein he stood, putting it over the beams thereof, being built like a barn, and high; by reason whereof he many times put his nose in my neck when I thought myself farthest distant from him, which familiarity of his I liked not; and howsoever the keepers assured me he would not hurt me, yet I avoided these his familiar kisses as much as I could. His body was slender, not greater, but much higher than the body of a stag or hart, but the head was less, and the face more beautiful; he had two horns, but short, and scarce half a foot long; and in the forehead he had two bunches of flesh; his ears and feet like an ox, and his legs like a stag." *W.*

* Giraffis et damis cornua cadunt. — *Belon, Gesner, Hist. Quad.* p. 148.

† See Itinerary, part i. book 3, chap. iv. p. 263.

cept when treating of the axis, where he remarks, "that the ground colour of the giraffe is white, and that the large spots scattered over the body are reddish, but not so red as those of the axis *." This fact, however, which I can no where discover, would be of great importance in determining the nature of the giraffe; for, if its horns shed annually, it belongs to the deer kind; and, on the other hand, if its horns are permanent, it must be referred to the ox or goat kind. Until we obtain a distinct knowledge of this fact, we cannot affirm, as our nomenclators have done, that the giraffe belongs to the genus of stags; and it is astonishing that Hasselquist, who has lately given a very long and very inanimated description of this animal, has said nothing concerning its nature. After amassing methodically, that is, like a school-boy, a hundred minute and insignificant characters, he says not a syllable regarding the substance of the horns, and leaves us ignorant whether they are solid or hollow, whether they shed or not, whether, in a word, they are *wood* or horns. I here give Hasselquist's † description, not on account of its utility,

* Observ. de Belon, p. 120.

† Cervus camelopardalis. Caput prominens, labium superius crassum, inferius tenue; nares oblongæ, amplæ; pili rigidi, sparsi in utroque labio anterius et ad latera. Supercilia rigida, distinctissima, serie una composita. Oculi ad latera capitis, vertici quam rostro, ut et fronti quam collo, propiores. Dentes, lingua cornua simplicissima, cylindrica, brevissima, basi crassa, in vertice capitis sita, pilosa basi pilis longissimis rigidis tecta, apice pilis longioribus erectis, rigidissimis, apicem

but of its singularity, and, at the same time, to persuade travellers to use their own eyes, and not to view objects through the medium of other men's: it is necessary to caution them against such methodical arrangements, the authors of which lay reason aside, and believe themselves wise in proportion to their want of genius. Have we advanced a single step, after fatiguing ourselves with this enumeration of minute, equivo-

longitudine superantibus, cincta. Apex cornuum in medio horum pilorum obtusus nudus. Eminentia in fronte, infra cornua, inferius oblonga humilior, superius elevatior, subrotunda, postice parum depressa, inæqualis. Auricula ad latera capitis infra cornua pone illa posita. Collum erectum, compressum, longissimum, versus caput angustissimum, inferius latiusculum. Crura cylindrica anterioribus plus quam dimidio longioribus. Tuburculum crassum, durum in genuflexum. Ungues bisulci, ungulati. Pili brevissimi universum corpus, caput, et pedes tegunt. Linea pilis rigidis longioribus per dorsum a capite ad caudam extensa. Cauda teres, lumborum dimidia longitudine, non jubata. Color totius, corporis, capitis, ac pedum ex maculis fuscis et ferrugineis variegatus. Maculæ palmari latitudine, figura irregulari, in vivo animali ex lucidiori et obscuriore variantes. Magnitudo cameli minoris, longitudo totius a labio superiore ad finem dorsi spith. 24. Longitudo capitis spith. 4, colli spith. 9 ad 10, pedum anter. spith. 11 ad 13, poster. spith. 7 ad 8, longit. cornuum vix spithamalis. Spatium inter cornua spith. ½, longit. pilorum in dorso poll. 3, latitud. capitis juxta tuberculum vel eminentiam spith. ½, prope maxillam spith. 1, colli utrinque prope caput spith. 1, in medios spith. 1½, ad basin spith. 2 ad 3, latitud. Lat. abd. anterius spith. 4, poster. spith. 6 ad 7. Crassities pellis aut corii cervi vulgaris. . . . Descriptio antecedens juxta pellem animalis farctam; animal vero nondum vidi. — *Voyage d'Hasselquist, Rostock*, 1762.

cal, and useless characters? Do not the descriptions given by the ancients and moderns, in the passages above quoted, convey a more distinct picture, and clearer ideas of this animal? Figures supply all such trifling characters; it is the province of history to mark those which are more important: a single glance of the eye upon a good figure conveys more information than descriptions of this kind, which always become more obscure in proportion to their minuteness.

In the year 1764, a drawing of the giraffe, accompanied with some remarks, was sent to the Academy of Sciences, from which we learn, that this animal, which was thought to be peculiar to Æthiopia *, is likewise found in the neighbourhood of the Cape of Good Hope. The figure is so incorrect, that no use can be made of it; but, as the remarks contain a kind of description, they merit insertion. " In an expedition, made in the year 1702, two hundred leagues to the north of the Cape of Good Hope, we found the camelopardalis, whose figure we have subjoined. The body resembles that of an ox, and the head and neck those of a horse. All those we met with were white with brown spots. It has two horns and cloven feet. The two we killed, and whose skins have been trans-

* The giraffe is no where found but in Æthiopia. I saw two tame ones in the royal palace. I remarked, that, when they wanted to drink, they were obliged to spread the fore-legs very wide, otherwise, though their necks were long, they could not reach the water. What I relate, I saw with my eyes.—*Relation de Thevenot*, p. 10.

mitted to Europe, were of the following dimensions: the length of the head, one foot eight inches; the height, from the extremity of the fore-foot to the withers, ten feet, and from the withers to the top of the head, seven feet; in all, seventeen feet high. The length, from the withers to the reins, is five feet six inches, and from the reins to the tail, one foot six inches: thus, the whole length of the body is seven feet. The height, from the hind-feet to the reins, is eight feet six inches. From the disproportion in the height and length, it appears that this animal can be of little use. He feeds upon the leaves of trees; and, when he wants to drink, or to take any thing from the surface of the earth, he is obliged to bend down on his knees."

In examining what travellers have said concerning the giraffe, I find they all agree, that this animal, when in its natural situation, can reach with its head from sixteen to seventeen feet high *; and that its fore-legs are twice as long as the hind-legs; so that, when it sits on its crup-

* Prosper Alpinus is the only author who gives a different idea of the magnitude of this animal, by comparing it to a small horse: "Anno 1581, Alexandriæ vidimus cameloparda-lem, quem Arabes zurnap et nostri giraffam apellant; hæc equum parvum elegantissimumque repræsentare videtur;" p. 236. There is every reason to believe, that the giraffe seen by Prosper Alpinus was very young, and had by no means acquired its growth. The same remark may be made with regard to the skin described by Hasselquist, which he says was of the size of a small camel.

per, it seems to be entirely on end*. They likewise agree, that, on account of this disproportion, it cannot run quickly; that its disposition is extremely mild; that, by this quality, as well as by other physical habits, and even by the form of the body, it approaches nearer to the nature of the camel than any other animal; and that it is one of the ruminating animals, and, like them, wants the cutting teeth in the upper jaw. We likewise learn, from the testimony of some voyagers, that this animal is found in the southern parts of Africa, as well as in those of Asia†.

* The fore-feet of the giraffe are twice as long as those behind, which, by supporting a long, straight, slender body, raises the fore part of the animal to a prodigious height. Its head nearly resembles that of a stag, except that its blunt horns exceed not half a foot in length. Its ears are long, like those of a cow, and it has no teeth in the upper jaw. Its hairs are round and fine, its limbs slender, resembling those of a stag, and its feet are like those of a bull. Its body is very slender, and the colour of its hair resembles that of the lynx. In manners and dispositions, it resembles the camel. — *Voyage de Villamont*, p. 688. I saw, at the castle of Cairo, two giraffes. Their neck was longer than that of the camel, and they had two horns, of half a foot in length, on the top of the head, and a small one on the front. The two fore-legs were very long, and the hind ones remarkably short. — *Cosmographie du Levant, par Thevet*, p. 142.

† In the island of Zanzibar, in the neighbourhood of Madagascar, there is a certain quadruped called *graffe*, or *giraffe*, which has a neck about a fathom and a half in length, and its fore-legs are much longer than those behind. Its head is small, and of different colours, as well as the body. This animal is very mild and tame, and never injures any per-

From what we have related, it is evident, that the giraffe is a peculiar species, and very different from all others. He seems, however, to make a nearer approach to the camel than to the stag or the ox. It is true, the giraffe has two horns, and the camel has none: but the other resemblances are so numerous, that I am not surprised to see the appellation of *Indian camel* bestowed on him by some travellers. Besides, we know not the substance of which the horns of the giraffe are composed; and, consequently, know not whether by this part he approaches nearer to the stag or to the ox: they may, perhaps, be a substance very different from either. They may be composed of a congeries of hairs, like the horns of the rhinoceros; or they may be a substance of a peculiar texture. Nomenclators seem to have been first led into the blunder of ranking the giraffe with the stags, by the pretended passage of Belon, quoted by Gesner, which, if real, would be decisive of the point: they appear likewise to have misunderstood what has been mentioned by authors concerning the hair of these horns. They imagined that these writers had said, that the horns of the giraffe were clothed with hair, like the new sprung horns of the stag; and hence concluded that they were of the same nature. We see, on the

son. — *Descript. des Indes Orientales, par Marc Paul*, liv. iii. p. 116. Giraffa animal adeo sylvaticum ut raro videri possit . . . . homines videns in fugam fertur, tametsi non sit multæ velocitatis. — *Leon. Afric. Descript. Afric.* tom. ii. p. 745.

contrary, from the notes above quoted, that the horns of the giraffe are only surrounded with hair, and have a tuft of large coarse hairs at the point, and not clothed with a down or velvet, like those of the stag. From this circumstance, it is not improbable, that the horns of the giraffe are composed of a congeries of hairs nearly in the same manner as those of the rhinoceros; their blunt or truncated points seem to favour this idea. Besides, if we consider that, in all animals, which carry antlers instead of horns, as the elk, the rein-deer, the stag, the roebuck, &c., this antler is always divided into branches; and that, on the contrary, the horns of the giraffe are simple, and consist but of one stem, we shall be convinced that they are not of the same nature, unless analogy, in this instance, be entirely violated. The tubercle on the front, which appears to be a third horn, strengthens this opinion. The two horns, which are not pointed, but blunt at the extremities, are perhaps only tubercles; of a greater length than the former. The females, according to the testimony of all travellers, have horns as well as the males, only they are somewhat smaller. If the giraffe really belonged to the deer kind, analogy would again suffer violation; for, among all the animals of this kind, none of the females, except the female rein-deer, have horns, and we have given the reason of this phænomenon. On the other hand, as the giraffe, on account of the excessive height of its limbs, cannot feed upon herbage, but with great difficulty; as its chief

and almost only food consists of the leaves and buds of trees, it may be presumed, that the substance of the horns, which are the most conspicuous residue of the organic particles derived from the food, is analogous to wood, like that of the stag. Time will confirm one or other of these conjectures. A single word more added to Hasselquist's minute description would have determined the genus of this animal. But school-boys, who have only their master's gamut in their heads, or rather in their pockets, must perpetually blunder, and make the most essential omissions; because they renounce that spirit of research which ought to guide every observer, and see only through the false medium of arbitrary arrangements, which prevents them from reflecting on the nature and relations of the objects they meet with, and obliges them to describe upon a bad model. As every object differs materially from another, the whole should be treated in a different manner. A single character happily discovered, is more decisive, and conveys more knowledge of the subject, than a thousand minute and trifling features; for, in proportion to their number, they necessarily become equivocal and common, and of course superfluous, if not hurtful, to the real knowledge of Nature, who sports with the rules we prescribe to her, soars above all methodical distributions, and can only be perceived by the penetrating eye of genius.

We here give the figure of a giraffe from a drawing transmitted to us from the Cape of Good Hope, which we have rectified in some

points from the information of Mr. Bruce. With regard to the horns of this animal, we are still uncertain whether they are permanent, like those of the ox, antelope, goat, rhinoceros, &c., or whether they are annually renewed like those of the deer kind. They seem to grow during the first years of the animal's life; but they never rise to a great height; for the longest which have been seen exceeded not twelve or thirteen inches; and they are generally not above six or eight inches. We are indebted to M. Allamand, a celebrated professor at Leyden, for the exact knowledge we have obtained concerning these horns. The following is an extract of a letter he wrote on this subject to M. Daubenton, dated October 31, 1766:

"I have the honour to inform you, that I am in possession of a stuffed giraffe. Both you and M. de Buffon have expressed a desire to know the nature of its horns. I have cut off one of them, which I send you, that you may have a more exact idea of it. You will remark that this giraffe was very young. The governor of the Cape, from whom I received it, writes me, that it was killed when lying near its mother. Its height is about six feet, and its horns, of course, are short, not exceeding two inches and a half. They are every where covered with skin and hairs; and those at the point are much longer than the others, and form a pencil, the height of which exceeds that of the horn. The base of the horn is more than an inch broad, and consequently forms anobtuse cone. To discover whe-

ther it was hollow or solid, I sawed it through longitudinally, along with a portion of the skull to which it adhered. I found it to be solid, and a little spongy, because it had not yet acquired all its consistence. Such is its texture, that it appears not to be composed, like that of the rhinoceros, of hairs united together; and it resembles the horns of the stag more than those of any other animal. I would even say, that there is no difference between these two substances, if I were certain, that a horn, lately sent to me under that name, was really the horn of a giraffe. It is straight, half a foot long, and pretty much pointed. There still remain some vestiges of the skin with which it had been covered; and it differs from a stag's horn only in figure. If these observations are not sufficient, I shall with pleasure send you the two horns, that you may examine them along with M. de Buffon. With regard to this animal, I should farther remark, that the alleged difference between its fore and hind-legs seems to be greatly exaggerated; for it is hardly perceptible in my young giraffe."

Beside these horns, which are found on the head of the female giraffe, as well as on that of the male, there is, at almost an equal distance between the nostrils and eyes, a remarkable excrescence, which seems to be a bone covered with a soft skin, and garnished with smooth hair. This osseous excrescence is more than three inches long, and is much inclined toward the

front, or makes a very acute angle with the bone of the nose. The colour of this animal's robe is a bright shining yellow, and the spots are, in general, rhomboidal.

It is extremely probable, from the inspection of these horns, which are solid, and resemble in substance the horns of the stag, that the giraffe may be ranked in the same genus: of this there could not remain a doubt, if we were certain that he shed his horns annually. But it is now unquestionable that he ought to be separated from the ox kind, and other animals whose horns are hollow. Meanwhile, we shall consider this large and beautiful animal as constituting a particular and solitary genus, which corresponds very well with the other facts in Nature, who, in voluminous species, never doubles her productions. The elephant, the rhinoceros, the hippopotamus, and perhaps the giraffe, are animals forming particular genera, or solitary species, who have no collaterals. This is a privilege which seems to be conferred solely on animals which greatly surpass all others in magnitude.

In a letter I received from Holland, the subscription of which was illegible, I had the following description of a giraffe:

"Africa produces no animal more beautiful or more curious than the giraffe. From the point of the nose to the tail, he is twenty-five feet long. He has received the name of *camelopard*, because he somewhat resembles the

camel in the figure of his head, the length of his neck, &c., and because his robe is variegated with irregular spots, like that of the leopard. He is found at twenty-four leagues from the Cape of Good Hope, and is still more frequent at greater distances. The teeth of this animal are similar to those of the stag. His horns are a foot long: they are straight as a man's arm, garnished with hair, and seem to be truncated at their extremities. The neck constitutes at least one half of the length of the animal, which, in figure, pretty much resembles that of a horse. The tail would also be pretty similar, if it were equally furnished with hair as that of the horse. The legs are like those of the stag; the feet are garnished with very black, obtuse, and widely separated hoofs. When the animal leaps, he first raises the two fore-feet, and then those behind, as a horse would do who had his two fore-feet tied together. He runs slowly, and with a bad grace: he may be easily overtaken in the chase. He carries his head always high, and feeds on the leaves of trees only, being unable to pasture on the ground, on account of his great height. When he drinks, he is obliged to rest on his knees. The females are generally of a bright yellow colour, and the males of a brownish-yellow. Some of them are nearly white, with brown or black spots."

Supplement from Schneider's Edition.

"M. de Buffon, with much propriety, blames our modern nomenclators, because, when treating of the giraffe, they are silent with regard to the nature of his horns, which alone can form a criterion to ascertain the species to which he belongs; and because they give dry and minute descriptions without adding a figure. We shall endeavour to supply both these defects.

"M. Allamand, professor of natural history in the university of Leyden, is in possession of the stuffed skin of a young giraffe. He obligingly communicated to us a drawing of it, which we caused to be engraven; and he added the following description:

"'M. Tulbagh, governor of the Cape of Good Hope, who has enriched our academical cabinet with many rare productions of Nature, writes me, that the young giraffe in our possession was killed by his hunters at a considerable distance from the Cape, when lying near its mother, whom it still sucked. Hence it appears, that the giraffe is not peculiar to Æthiopia, as Thevenot has alleged.

"'As soon as I received it, I examined the horns, with a view to elucidate M. de Buffon's doubt with regard to their substance. They are not hollow, like those of oxen and goats, but solid, and nearly of an uniform texture, like those of the stags, from which they differ only in being thinner, straighter, and not divided into branches,

or antlers. They are totally covered with the skin of the animal: and, for three fourths of their length, this skin is furnished with short hair, similar to that which covers the body. Toward the points, the hair becomes longer, rises about three inches above the blunt end of the horns, and is of a black colour. Hence it is very different from the down on the young horns of the stag.

" 'These horns appear not to be composed of united hairs, like those of the rhinoceros. Their texture is likewise totally different. When sawn through longitudinally, we perceive that they consist of a hard plate, which constitutes their external surface, and incloses a spongy substance. This, at least, is the case with the horns of my young giraffe. Perhaps the horns of adults are more solid. M. de Buffon is now in a condition to determine this point; for, along with the horns of my giraffe, I sent him another belonging to one more advanced in years, which a friend of mine received from the East Indies.

" 'Though these horns are solid, like those of the stag, I suspect that the animal does not shed them annually. They seem to be an excrescence of the frontal bone, like the bone which serves as a nucleus to the hollow horns of oxen and goats; and, consequently, it is impossible that they can fall off. If this conjecture be well founded, the giraffe constitutes a particular genus, perfectly distinct from the animals which shed their horns, and also from those which have hollow but permanent horns.

" 'In the middle of the front of adult giraffes, there is a protuberance which seems to be the

rudiment of a third horn. No such protuberance appeared in our giraffe; probably because it was too young.

" 'All the authors, both ancient and modern, who describe this animal, tell us, that the fore-legs are twice as long as the hind ones. They could not possibly be deceived concerning a character so striking. But I can affirm, that, in this article, the giraffe must change greatly in growing; for, in our young one, the hind-legs were equally long with those before. This circumstance, however, prevents not the anterior part of the giraffe from being higher than the posterior, which is owing to the difference in the thickness of the body, as may be seen in the figure. But this difference is by no means so great as has been represented.

" 'The neck of the giraffe is the first thing which strikes a spectator. It is longer than that of any other quadruped, not excepting the camel, who, besides, folds his neck in different ways, which the giraffe seems to be incapable of performing.

" 'His colour is a dirty white, interspersed with yellowish spots, very near each other on the neck, more distant on the rest of the body, and of a figure which approaches to a parallelogram or rhomb.

" 'The tail is slender, in proportion to the length and stature of the animal. Its extremity is garnished with a tuft of black hairs, which are seven or eight inches long.

" 'The mane is composed of reddish hair, three inches long, and inclined toward the hind

part of the body. It extends from the head along the neck, and down to the middle of the back; and, at the distance of some inches, it is again continued; but the hair inclines toward the head. It seems to recommence near the origin, and to extend to the extremity of the tail: but the hairs are short and scarcely to be distinguished from those which cover the rest of the body.

" 'The eyelids, both superior and inferior, are garnished with a range of very stiff hairs. There are similar hairs, but thinly scattered, round the mouth.

" 'The aspect of the giraffe indicates a mild and docile animal; and this is the character given of him by those who have seen him alive.'

" This description of the giraffe, added to what M. de Buffon has collected from different authors, and accompanied with the figure, is sufficient to give us more exact ideas concerning this animal than we had hitherto obtained."

M. Allamand's great knowledge and accuracy, in every subject of which he treats, are apparent from the above description. I would have copied his engraving, if his giraffe had not been too young. The figure I have given is that of an adult. I shall only remark, that I suspect the longest of the horns he was so obliging as to send me, does not belong to a giraffe. The short ones are very thick, while it is very thin, in proportion to their respective lengths. In the anonymous description above related, it is said, that the horns of the adult giraffes are *a foot in*

length, and as thick as a man's arm. If the horn under consideration, which is half a foot long, really belonged to a giraffe, it ought to be double its present thickness. Besides, this pretended horn of a giraffe is so similar to the first horns of a young stag, that it may be regarded as belonging to the latter animal.

As to the nature of the giraffe's horns, I am inclined to adopt M. Allamand's opinion. The protuberance on the front, which is unquestionably osseous, makes a kind of third horn. The horns adhered to the cranium, without the support of moulds; and, consequently, ought to be considered as osseous prolongations of the bones of the head. The hair which surrounds and overtops them has no resemblance to that which covers the young shoots of the stag, or fallow deer. This hair seems to be permanent, as well as the skin from which it issues. Hence the horn of the giraffe is a bone, and differs from that of the ox by its covering, the latter being surrounded with a horny substance, or hollow horn, and the former with hair and skin.

When we gave the first parts of the article of giraffe (whose height exceeds that of all other quadrupeds) we had collected nothing but imperfect notions of its conformation and habits. Although we carefully compared all that had been written on the subject of the giraffe, by the ancient and modern naturalists, we were still ignorant if its head was provided with antlers or horns. Mr. Gordon, a very enlightened observer, whom we have frequently quoted with

praise, has made a second journey into the interior of Southern Africa: he there saw and took several giraffes, and, having examined them attentively, sent a drawing of one to M. Allamand, which I have copied and engraved: we have added some interesting details on the conformation and habits of this animal, so remarkable for its height.

The giraffes, says Gordon, are found towards the twenty-eighth degree of southern latitude, in the country inhabited by the Negroes, which the Hottentots call *brinas*, or *briquas*: the species does not appear to spread towards the south beyond the twenty-ninth degree, and extends only five or six degrees east from the meridian of the Cape. The Cafres, who occupy the eastern coasts of Africa, know nothing of the giraffe; it seems, also, that they have not been seen by any traveller on the western coasts of this continent, of which they inhabit the interior only. They are limited, as we have stated, towards the south, east, and west, and are again met with to the northward, as far as Abyssinia, and even in Upper Egypt.

When these animals are standing quietly, their neck is in a vertical position. In the full grown animal, the height, from the ground to the top of the head, is fifteen or sixteen feet. The giraffe that I have figured, the skin of which is in the collection of M. Allamand, was fifteen feet two inches high: the body was only five feet five inches long from the fore part of the breast to the origin of the tail. It was nine feet eleven inches

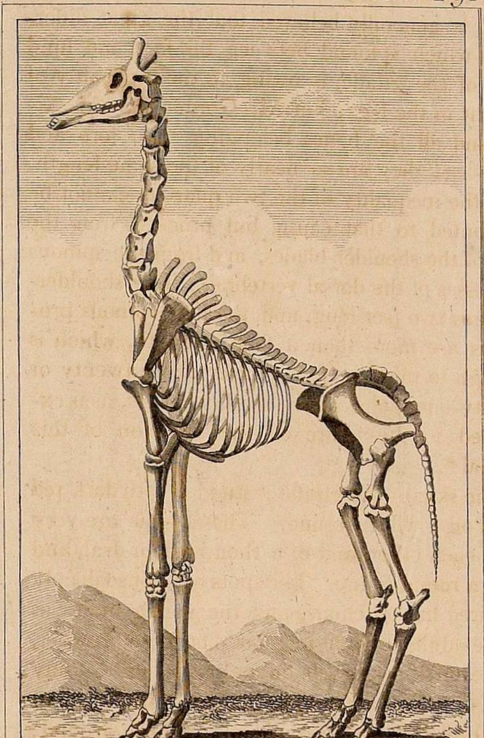
high, measured from the top of the shoulders, but not more than eight feet two inches, measured from the hind quarters.

It is generally believed that the great difference which is found between the fore and hind part of the giraffe, is owing to the inequality of height in the legs; but Mr. Gordon sent M. Allamand all the bones belonging to a fore and hind-leg: they are so nearly of the same length, that the inequality of the two quarters cannot be attributed to that cause, but proceeds from the size of the shoulder-blades, and from the spinous processes of the dorsal vertebræ. The shoulder-blade is two feet long, and the first spinous processes are more than a foot in length, which is enough to raise the fore quarter about twenty or twenty-one inches above the hind parts, as is expressed in the figure of the skeleton of this animal *.

The skin of the giraffe is studded with dark red spots on a white ground. These spots are very near each other, and of a rhomboid, or oval, and even a round figure. The spots are not so deeply coloured in the females and the young males as in the adults, and all in general become browner, and even black, as the animal grows old. Pliny says, that the camelopard (which is the same as the giraffe) has white spots on a reddish ground; and, in fact, when this animal is seen at a distance, it appears almost entirely red, because the

* Sonnini informs us that this skeleton, which made part of the stadtholder's collection, is now in the museum at Paris. W.

Plate 291



Warner Sc.

SKELETON *of the* GIRAFFE.

spots are much larger than the intermediate spaces, so that the intervals seem to be white spots scattered on a reddish ground. The head of the giraffe somewhat resembles that of a sheep: it is more than two feet long. The skull is very small; it is covered with hairs sprinkled with spots like those on the body, but smaller. The upper lip projects more than two inches beyond the lower one: there are eight small cutting teeth in the lower jaw; but (as in other ruminating animals) none in the upper jaw.

Joseph Barbaro, quoted by Aldrovandus, says that the giraffe has a slender, violet, round tongue, two feet long, and that it serves as a hand to gather the leaves upon which the animal feeds; but this is an error, and Mr. Gordon has observed, in all the giraffes which he dissected, that the tongue, in shape and substance, resembles that of the antelopes, and he also remarks that their internal structure is nearly the same, and that the gall-bladder is very small.

The eyes are large, well cut, brilliant, and of a gentle aspect. Their longest diameter is two inches nine lines, and the eyelids are furnished with long and stiff lashes: there is no *larmier* (sinus) below the eyes.

The giraffe has two horns upon the top of the forehead, a little inclined backwards. We have previously supposed, from that which M. Allamand sent us, that they were never shed annually like the antlers of stags, but that they were permanent, like those of oxen, rams, &c. Our opinion has been completely confirmed by the

observations of M. Allamand on a bare skull in his collection. The horns of the giraffe are bony excrescences, making part of the forehead, on which they rise to the height of seven inches; their circumference, at the base, is more than nine; they are terminated by a kind of thick button. They are covered with a skin furnished with black hairs, forming a sort of brush at the end, where they are longest; but this, however, is wanting in some individuals, probably because they rub them off against the trees. Also the horns of the giraffe are not antlers, but horns, like those of oxen, and differ only in their covering; the horns of oxen being incased in a horny substance, and those of the giraffe being merely covered by a hairy skin.

There is a protuberance on the middle of the forehead (independent of the two horns), that at first sight might be taken for a third horn, but which is only a spongy excrescence of the frontal bone, about four inches diameter, by two inches in height: the skin which covers it is sometimes callous and bare, on account of the habit which these animals have of rubbing their head against the trees.

The ears are eight or nine inches long, and, between them and the horns, we remark two protuberances, composed of glands, of a considerable size.

The neck is six feet in length; which gives to each vertebra so great a thickness, that the neck can be hardly flexible. It is provided with a mane, that begins at the head, and terminates

on the top of the shoulders, in adults, but extends to the middle of the back in young giraffes. It is composed of hairs three inches long, forming tufts alternately of different depths.

The back, near the shoulders, is greatly elevated; it afterwards sinks, and rises and sinks again towards the tail, which is two feet long, and very thin: it is covered with very short hairs, and has a tuft at the end of strong, flattish, black hairs, two feet long. The Negresses use the mane of the giraffe to fasten their bracelets of iron and copper.

The belly, near the breast, is five feet seven inches above the ground, and only five feet towards the hind-legs: it is covered with whitish hairs. The legs are spotted like the rest of the body to the fetlock, which is spotless, and of a dirty white. The hoofs are much higher before than behind, and are not surmounted by false hoofs, as in other cloven-footed animals.

After all the comparisons which can be made between the males and the females, either in respect to form or colours, we do not find any sensible difference; and, in reality, there is but one, which is in the size, the females being always smaller than the males. They have four teats, although they generally produce but one young, which agrees with what we know of all great animals, who commonly bring forth only one little one at each birth.

Although the bodies of these animals seem to be disproportioned in many parts, still their appearance is striking, and they attract attention

by their beauty, when they are standing with their heads erect. The colour of their eyes indicates their nature. They never attack other animals, nor butt like rams; and it is only when they are driven to extremity that they defend themselves with their feet, with which they then strike the ground with violence.

The pace of the giraffe is an amble; the hind and fore-foot of the same side go together; and, in its gait, the body always appears upon the balance. When it wishes to go quicker, it never trots, but gallops, supporting itself on its hind-feet, and then, to maintain the equilibrium, the neck is carried backward, when it rises before, and forward when it rests on the ground; but, in general, the motions of this animal are not very quick; however, as the legs are very long, they can take great steps, and, as they can continue their pace for a very long time, it is difficult to follow, and even to overtake them with a good horse.

These animals are very gentle, and we believe that it is possible to tame and render them domestic; nevertheless, they are not so any where. In their wild state, they feed on the leaves and fruits of trees, which, by the conformation of their bodies and the length of their neck, they procure with greater facility than the grass which is under their feet, and which they can never reach without bending the knee.

Their flesh, especially when young, is good to eat, and their bones are filled with a marrow that the Hottentots find exquisite; therefore they

frequently hunt the giraffes, which they kill with poisoned arrows. The skin of these animals is half an inch thick; the Africans use it for different purposes, and make vessels of it to preserve their water in.

The giraffes inhabit the plains only: they always go in little societies of five or six, and sometimes ten or twelve; however, the species is not very numerous. They lie down on the belly to rest, which gives them the callosities on the legs and below the breast *.

* When the giraffe is quiet and is seen in front, so that the fore quarter covers the hind parts, it appears exactly like the trunk of a dead tree.

In the Liverpool Museum there is a well stuffed skin of a giraffe, which was shot by a missionary in Africa. It is seventeen feet three inches high, from the top of the head to the fore-feet, and resembles the figure given by Buffon, except in the legs, which are not swelled, and in being comparatively shorter in the back, and higher before.

That the giraffe was known to the Romans, appears from the writings of Pliny, who tells us that it was first exhibited in the Circæan games, by Cæsar the Dictator. It was afterwards more frequently introduced in the Roman shows, and once graced the triumph of Aurelian. We find the figure of this animal on some medals, and the prœnestine pavement was for a long time the only evidence we had of its existence. *W.*

THE LAMA* AND THE PACOS†.

IN all languages, two names are frequently bestowed on the same animal, one of which relates to its state of liberty, and the other to its

* CHARACTER SPECIFICUS ‡.

CAMELUS GLAMA. C. dorso lævi, topho pectorali. — *Linn. Syst. Nat. Gmel.* i. p. 169.

Camelus pilis brevissimis. — *Briss. Quadr.* p. 55.

Camelus Peruvianus, glama dictus. — *Ray's Syn. Quadr.* p. 145.

OVIS INDICA. — *Gesn. Quadr.* p. 119.

OVIS PERUVIANA. — *Jonst. Quadr.* p. 46, pl. 29. — *Marc. Bras.* p. 243.

LE LAMA. — *Buff. Hist. Nat. par Sonn.* xxxii. p. 63, pl. 4.

LLAMA. — *Ulloa's Voy.* i. p. 365, pl. 24, fig. 5. — *Penn. Hist. Quadr.* i. p. 133, pl. 25.

GLAMA. — *Shaw's Gen. Zool.* ii. p. 241, pl. 168.

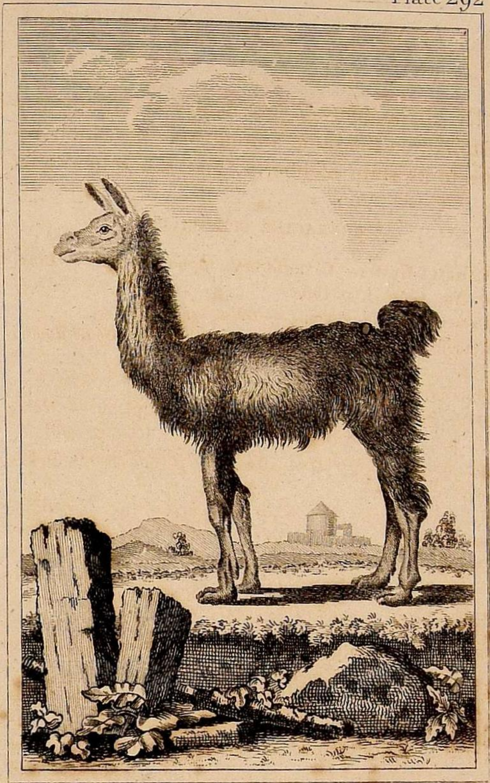
HABITAT

in montibus alterioribus regni Peruani, sub nomine Guanico s. Guanaco, cellerimus, gregarius. *W.*

The lama, or camel of Chili and Peru, has an almost even back, small head, fine black eyes, and very long neck, bending much, and very protuberant near the junction with the body. In a tame state, it has smooth short hair; in a wild state, long coarse hair, which is white, gray, and russet, disposed in spots. According to Hernandez, it is yellowish,

‡ For the generic character, see Camel.

Plate 292



LAMA.

domestic state. The wild boar and hog are the same animal, and these two names have no relation to any difference in the nature of the crea-

with a black line from the head along the top of the back to the tail, and the belly is white. The spotted may possibly be the tame; the last, the wild lamas. The tail is short; the height is from four to four and a half feet; and the length, from the neck to the tail, six feet. In general, the shape exactly resembles that of the camel, only it wants the dorsal bunch. — *Pennant's Synops. of Quad.* p. 64.

Lamu, lhama, glama, huanacus, guanaco, cornera de tierra, guanapo, wianaque, pelon ichiatl oquitli, hueque chillehueque, names given to this animal by the Spaniards, and the natives of Chili and Peru.

† CHARACTER SPECIFICUS.

CAMELUS PACO. C. tophis nullis, corpore lanato, rostro oblongo. — *Linn. Syst. Nat. Gmel.* i. p. 171. — *Erxleb. Mamm.* p. 226.

Camelus Peruvianus laniger Pacos dictus. — *Ray's Quadr.* p. 147.

Alia species Pacos dicta. — *Hernand. Mex.* p. 663.

LE PACO OU ALPACO. — *Molini,* p. 296.

LE PACO. — *Buff. Hist. Nat. par Sonn.* xxxii. p. 63.

PACOS. — *Penn. Hist. Quadr.* i. p. 137. — *Shaw's Gen. Zool.* ii. p. 245.

HABITAT

in montibus alterioribus regni Peruani, gregarius.

W.

The body of the pacos is covered with long and very fine wool, of the colour of dried roses, or a dull purple. The belly is white: in a tame state, the colour varies. It is shaped like the former, but much less. The leg of one I saw was about the size of that of the buck. — *Pennant's Synops. of Quad.* p. 66.

tures, but to the condition of the species, one part of which is under the dominion of man, and the other independent. The same remark applies to the lamas and pacos, which were the only domestic animals* of the ancient Americans: these names were appropriated to the animals in their domestic condition. The wild lama was called *huanacus*, or *guanaco*, and the wild pacos, *vicuna*, or *vigogne*. I thought this remark necessary to prevent confusion. These animals are peculiar to the New World: they even love particular lands, beyond which they are never found. They appear to be confined to that chain of mountains which extends from New Spain to Terra Magellanica. They inhabit the most elevated regions of this globe, and seem to require a lighter air than that of our highest mountains.

It is singular, that, though the lama and pacos are domestic in Peru, Mexico, and Chili, as the horse is in Europe, or the camel in Arabia, we have hardly any knowledge of them; and that, though the Spaniards have had the dominion of these vast countries for more than two centuries, none of their authors have given a complete history and exact description of these animals. It is alleged, indeed, that they cannot be transported into Europe, nor even descend from their mountains, without perishing in a short time. But, in Quito, Lima, and other

* Before the arrival of the Spaniards, the Indians of Peru had no domestic animals but the pacos and the huanacus. — *Hist. des Incas*, p. 265.

towns, where men of letters reside, these animals might be drawn, described, and dissected. Herrera* says very little concerning them; and Garcilasso† only copies what had been mentioned by other writers. Acosta and Gregoire de Bolivar have collected the greatest number of facts regarding the natural dispositions of the lamas, and the utility derived from them. But we know nothing of their internal structure, and of their time of gestation: we know not whether the lama and pacos be two distinct species; or whether they intermix together. These, and many other facts necessary to complete their history, are still objects of inquiry.

Though they are said to perish when removed from their native country, it is certain, that, after the conquest of Peru, some lamas were transported to Europe. The animal mentioned

* In the mountains of Peru there is a species of camel, the wool of which is manufactured into cloth. — *Descript. des Indes Occidentales, par Herrera,* p. 244.

† P. Blas Vallera remarks, that the cattle of Peru are so mild that children use them as they please. There is a larger and a smaller kind. The tamed huanacus (*lamas*) are of different colours, and the wild kind are all of a bay brown. These animals are about the height of a stag, and resemble the camel, only they want the bunch, and their neck is long and smooth. . . . The cattle called *paco lamas* (*pacos*) are not nearly so much esteemed. . . . The pacos are smaller than the lamas, and resemble the wild vicunas. They are very delicate and slender; and their wool, though the quantity of it be small, is extremely fine. Acosta remarks, that this animal, as well as several others, is variously employed as a medicine by the natives. — *Hist. des Incas,* tom. ii. p. 260.

by Gesner, under the name of *allocamelus*, and of which he gives a figure, is a lama, that was brought alive from Peru to Holland in the year 1558*. It is the same with that mentioned by Matthiolus†, under the denomination of *elaphocamelus*, and which he has pretty accurately

* Allocamelus Scaligeri apparet esse hoc ipsum animal cujus figuram proponimus ex charta quadam typis impressa mutuati cum hac descriptione. Anno Domini 1558, Junii die 19. animal hoc mirabile Mittelburgum Selandiæ advectum est, antehac a Principibus Germaniæ nunquam visum, nec a Plinio aut antiquis aliis scriptoribus commemoratum. Ovem Indicam esse dicebant e Piro (*forte Peru*) regione, sexies mille milliaribus fere Antverpio distante. Altitudo ejus erat pedum sex, longitudo quinque; collum cigneo colore candidissimum. Corpus (*reliquum*) rufum vel puniceum. Pedes ceu struthocameli, cujus instar urinam quoque retro reddit hoc animal (erat autem mas annorum ætatis quatuor). — *Gesner, Hist. Quad.* p. 149, et 150.

* Longitudo totius corporis a cervice ad caudam 6 pedum erat; altitudo a dorso ad pedis plantam 4 tantum. Capite, collo, ore, superioris præsertim labii scissura ac genitali, camelum fere refert; at caput oblongius est; aures habet cervinas, oculos bubulos, quin etiam ut ille anterioribus dentibus in superiore maxilla caret, sed molares utrinque habet; ruminat, dorso est sensim prominente, scapulis prope collum depressis, lateribus tumidis, ventre lato, clunibus altioribus, et cauda brevi spithamæ fere longitudine; quibus omnibus cervum fere refert, quemadmodum etiam cruribus præsertim posterioribus; pedes illi bisulci sunt, diducta anteriori parte divisura. Ungues habet acuminatos qui circa pedis abitum in cutem crassam abeunt, nam pedis planta, non ungue sed cute, ut in multifidis et ipso camelo, contegitur; retromingit hoc animal ut camelus, et testes substrictos habet; pectore est amplo, sub quo, ubi thorax ventri connectitur, extuberat globus ut in camelo, vomicæ similis, e quo nescio quid excrementi sensim manare videtur. — *P. And. Matthioli, Epist.* lib. v.

described. The pacos, and perhaps also the lama, have several times been brought to Spain, with a view to naturalize them *. We ought, therefore, to be better informed concerning these animals, which might be rendered extremely useful to us; for it is probable that they would thrive on our Alps † and Pyrennees, as well as on the Cordelieres.

Peru, according to Gregoire de Bolivar, is the native country of the lamas: they have, indeed, been brought into other provinces, as New Spain, where, however, they are regarded more as objects of curiosity than of utility. But, through the whole extent of Peru, from Potosi to Caracas, these animals are extremely numerous. They constitute the sole wealth of the Indians, and contribute not a little to that of the Spaniards. The flesh of the lamas is good eating; their wool is excellent; and their whole lives are spent in transporting the commodities of the country. Their common load is a hundred and fifty pounds, and the strongest of them carry two hundred. They travel pretty long journeys in a country impassable to all other animals. They march slowly, and seldom accomplish more than four or five leagues a day. Their gait is grave and

* The king of Spain ordered pacos to be brought to Spain, in order to propagate and naturalize them. But they were all killed by the climate.—*Hist. des Aventur. Flibust. par Oexmelin*, tom. ii. p. 367.

† No animal walks so securely upon rocks as the lama; because he adheres by means of a kind of spur on his feet.—*Voyage de Coreal*, tom. i. p. 352.

firm. They descend precipitous ravins, and climb steep rocks, where even man himself dares not accompany them. They walk commonly four or five days on end, after which they wish to repose; and they spontaneously rest twenty-four or thirty hours before they resume their march. They are much employed in transporting the rich ores dug out of the mines of Potosi. Bolivar remarks, that, in his time, three hundred thousand of these animals were constantly occupied in this work.

Their growth is quick, and their life is not of long duration. At the age of three years, they are in a condition to produce, and continue in full vigour till twelve, when they begin to decay; and, at fifteen, they are entirely useless. Their natural disposition seems to be modelled upon that of the Americans. They are mild and phlegmatic, and perform every thing by weight and measure. When they incline to rest a few minutes in their jouruey, they bend their knees, and lower their bodies with the greatest precaution, to prevent their load from falling, or being deranged; and, whenever they hear their conductor's whistle, they rise with the same precaution, and proceed on their journey. In going along, they browse wherever they find herbage; but they never eat in the night, even though they have been sparingly fed during the day; for this time is spent in chewing their cud. When they sleep or ruminate, they rest on their breast, with their legs folded under their belly. When fatigued with travelling, if they once sink down

under the load, no blows can force them to rise. The last resource is to squeeze their testicles; but even that is often ineffectual. They remain obstinately where they lie; and, if their master continues to abuse them, they despair and kill themselves, by alternately striking their heads from right to left upon the ground. They neither defend themselves with their feet nor their teeth, and they may be said to have no other arms but those of indignation. They spit in the face of those who insult them; and, it is alleged, that the saliva which they throw out when enraged, is so acrid as to raise blisters on the skin.

The lama is about four feet high, and his body, including the neck and head, is five or six feet in length. This animal has a well shaped head, large eyes, a pretty long muzzle, and thick lips, the superior one being divided, and the inferior somewhat pendulous. He has neither cutting nor canine teeth in the upper jaw. His ears are four inches long, which he carries forward, erect, and moves at pleasure. The length of his tail, which is straight, slender, and a little raised, exceeds not eight inches. His feet are cloven, like those of the ox; but they are armed behind with a spur, which assists the animal in supporting itself upon rugged and difficult ground. The wool upon his back, crupper, and tail, is short, but very long upon the flank and belly. The lamas vary in colour; some of them are white, others black, and others of a mixed

colour *. Their dung resembles that of the goat. The penis of the male is slender, and crooked in such a manner that he discharges his urine backward. The lamas are extremely lascivious †,

* The head of the lama is proportionally small, and has some resemblance to that of the goat and sheep. The upper lip is divided like that of the hare: through this aperture they spit, to the distance of ten paces, upon those who disturb them; and, if the saliva falls upon the face, it inflames or blisters the skin. They have a long neck, which bends downward where it springs from the body, like that of the camel, to which they would have a considerable resemblance, if they had a bunch on the back. Their height is about four feet and a half. They walk with their head erect, and with a pace so uniform, that even blows are incapable of making them move more quickly. They will not carry their loads during the night; but are obliged to be unloaded, in order to allow them to pasture. They eat little, and are never furnished with drink. Like the sheep, they have cloven feet, and a spur above, which renders them sure footed among the rocks. Their wool has a strong odour: it is long, spotted with white, gray, and red, and equally beautiful, though of an inferior quality, with that of the pacos. — *Voyage de Frezier*, p. 138.

† Salacissimum hoc esse animal id mihi conjecturam facit, quod cum sui generis femellis sit destitutum, magna cum prurigine capris se commisceat, non tamen erectis ut alias capræ hirco ascendente solent, sed humi ventre accubantibus, ita cogente animali anterioribus cruribus. Itaque super ascendens coit, non autem aversis clunibus. Adeo venere, vernali autumnalique tempore, stimulatur hoc animal ut illud viderim humile quoddam præsepium avena refertum conscendisse, genitaleque illi magno cum murmure tamdiu confricasse, quo usque semen redderet, plurimis una hora replicatis vicibus. Non tamen concepere capræ hujusce animalis semine refertæ. *Matthiol. Epist.* lib. v.

and yet they copulate with much difficulty. The aperture of the female is very small. She prostrates herself to receive the male, and invites him with her sighs. But several hours, and sometimes a whole day passes, before they can accomplish their purpose: all this time is spent in groaning, grumbling, and particularly in conspurcating each other: as these tedious preludes are more fatiguing than the operation itself, their keeper abridges their labour, and aids their arrangement with his hand. They seldom produce more than one at a time. The mother has only two teats, and the young one follows her the moment after it is brought forth. The flesh of the young ones is very good; but, when old, it is dry and hard. The flesh of the domestic is better than that of the wild lamas, and their wool is likewise much softer. Their skin is very compact: the Indians make shoes of it, and the Spaniards use it for harnesses. The food of these animals, which are so useful in the country that produces them, costs almost nothing. As they are cloven-footed, they require no shoes; and the thick wool with which they are covered, renders saddles unnecessary. They have no need of corn or hay; green herbage, of which they take but small quantities *, being sufficient for their

* The skin of the huanacus is hard: the Indians soften it with grease, and use it for soles to their shoes. But as this leather is not curried, it is soon wasted by the rain: the Spaniards make fine harnesses to their horses of the lama's hide: they employ these animals, as the Indians do, in transporting their merchandise. Their common route is from

nourishment. In drinking, they are still more moderate. They quench their thirst with their saliva, which, in this animal, is more abundant than in any other.

The lama engraved in the plate, was designed after nature, and is still living (August 1777) at the veterinary school of the Chateau of Alfort. This animal, brought from the Spanish Indies to England, was sent us in the month of November, 1773: it was then young, and its mother, who

Cozer to Potosi, which is about two hundred leagues, and their daily journey seldom exceeds three leagues; for they walk slowly, and, if pushed beyond their ordinary pace, they lie down, and it is impossible to raise them, even when the load is taken off their backs; so that they often die on the spot. . . . . When transporting goods, they go in troops, and forty or fifty of them are always left unloaded, in order instantly to relieve those which begin to be fatigued. The flesh of this animal is excellent; for it is both well tasted and wholesome, especially that of the young ones, which exceed not four or five months old. . . . . Though these animals are very numerous, their food costs almost nothing; for, after their journey, they are unloaded, and allowed to pasture in the fields. It is unnecessary to shoe or saddle them; for they are cloven-footed; and their wool prevents them from being incommoded by their load, which their masters take care not to place on their back bone, otherwise it would kill them. . . . . The conductors of these animals never enter the towns, but sleep in tents, that their cattle may have an opportunity of pasturing during the night. They take four months in performing a journey from Cozer to Potosi, two in going, and as much in returning. . . . . At Cozer, the best lamas sell at eighteen ducats a piece, and the common sort at twelve or thirteen. The flesh of the wild huanacus is good, but inferior to that of the domestic kind.—*Hist. des Incas*, tom. ii. p. 260.

accompanied it, died almost as soon as she arrived. The stuffed skin and the injected body, may be seen in the anatomical collection of M. Bourgelet.

Although this was a young lama, and the voyage and confinement had doubtless influenced its growth, yet it was nearly five feet high, measured from the crown of the head to the fore-feet, and increased considerably after it was set at liberty. The lama is to the New Continent what the camel is to the Old; it appears like a beautiful dwarf, for its figure is elegant, and resembles the camel in many respects, without having any of that animal's deformities. Like the camel, it carries burdens; it has the woolly hair, the thin legs, the feet short, and shaped nearly like the legs and feet of the camel; but it differs, inasmuch as it has no bunch, a short tail, long ears, and that, in general, it is of a much better shape, and of more agreeable proportions. Its long woolly neck and erect head, give it a light and noble air, which Nature has denied to the camel: its ears, seven inches long by two broad, are pointed, and are always carried straight forward: they are covered with short, blackish hair. The head is long, light, and elegantly formed; the eyes are large, black, and furnished with long black hairs on the internal angles; the nose is flat, and the nostrils wide apart; the upper lip is slit, and so far separated in front of the jaws, that the two middle cutting teeth appear, of which there are four in the lower jaw, but none in the upper, as in other

ruminating animals: there are only five grinders on each side above and below, which make, in all, twenty grinders and four cutting teeth. The head, the back, the rump, the tail, and the legs, are clothed with woolly hair of a ferruginous brown, lighter on the cheeks, the neck, and the breast, and darker on the thighs and legs, where it becomes almost black. The top of the head is also blackish, and it is from thence that the black originates which we perceive on the forehead, round the eyes, the nose, the nostrils, the upper lip, and half the cheeks. The wool on the neck is of a deep brown, and forms a mane, which reaches from the head to the withers: this same brown colour extends, but with diminished strength, on the back, where it forms a faint brown band. The thighs are furnished behind with great flocks of long wool, but the legs have only a short blackish-brown hair. The fore knees are remarkably thick, whereas towards the middle of the hind-legs we find a space under the skin, which is hollow for about two inches: the feet are separated into two toes: each toe has a horny hoof, an inch and a half long; and this horn is of a sleek black, flat on its internal face, and round externally: the horns of the hind hoofs are singular, being hooked at their ends. The trunk of the tail is more than a foot long; it is covered with short wool, and has a tufted appearance; the animal carries it straight, either walking or running, and even when lying down and resting.

This animal is very gentle; it is neither violent

nor mischievous; it is even caressing; it suffers itself to be mounted by its keeper, and does not refuse the same indulgence to others: it walks, trots, and even gets into a kind of gallop. When it is at liberty, it skips, and rolls itself on the grass. This lama was a male; we observed that it often appeared to be influenced by the desire of love: it urines backwards, and the *verge* is small for the size of its body: it had passed eighteen months without drink in May last, and it appears to me that drink is not necessary, considering the great abundance of saliva with which its mouth is continually moistened.

We learn from Byron's Voyage, that guanacos, that is to say, lamas, are found on the Isle of Penguins, and in the interior of the country to the Virgin's Cape, which forms the north entrance to the Straits of Magellan; thus these animals are not afraid of cold. In their wild state, they generally go in troops of sixty or eighty, and do not suffer themselves to be approached; however, they are very easily tamed, for the crew of Byron's ship, having taken a young lama of a pretty figure, tamed it so completely, that it came and licked their hands. Commodore Byron and captain Wallis, compare this animal to the fallow deer in size, shape, and colour; but Wallis is mistaken, in saying that it has a bunch on the back.

The huanacus, or lamas, in a state of nature, are stronger, more active, and nimbler than the domestic kind. They run like the stag, and, like the wild goat, they climb the steepest rocks.

Though in full possession of liberty, they assemble in flocks, sometimes to the number of two or three hundred. When they perceive any person, they look at him with astonishment, discovering neither fear nor pleasure: they then blow through their nostrils, neigh nearly like a horse, and fly off together to the tops of the mountains. They prefer the north side and the cold regions of the hills. They often climb and sojourn above the line of the snow. When travelling on ice and covered with hoar-frost, they are in better plight than in a temperate climate. In the Sierras, which are the most elevated parts of the Cordilleras, they are much more numerous, and have more strength and vigour than in the Lanos, which are lower. These wild lamas are hunted for the sake of their fleeces. It is difficult for the dogs to follow them; and, if allowed time to gain the rocks, both the hunters and dogs are obliged to abandon them. They seem to be as much afraid of the weight of the air as of heat; for they are never found in low lands: and, as the chain of the Cordilleras, which is more than three thousand fathoms above the level of the sea at Peru, preserves nearly the same elevation from Chili to the Straits of Magellan, the huanacus, or wild lamas, are very numerous throughout all that extent *. But, on the coast

* In the neighbourhood of Port Desire, at some distance from the Straits of Magellan, we found a number of those wild sheep, which the Spaniards call *winaques*. . . . Though very alert and timid, we killed seven of them during our stay; and their wool seems to be much finer than that of any other

of New Spain, where these mountains sink considerably lower, no lamas are to be found, except the domestic kind, which are brought thither.

The pacos, or vicunas*, are a species which may supply that of the lamas, as the ass might supply the place of the horse. They are smaller, and less proper for labour; but their fleeces are more useful. The long wool with which they are covered, is an article of luxury, as good and as precious as silk. The pacos, which are also called *alpaques*, when in a domestic state, are often totally black, and sometimes of a brown colour mixed with yellow. The wild pacos, or vicunas, have the colour of dried roses; and this natural colour is so fixed, that it suffers no change from the hand of the workman. Their wool makes excellent gloves, stockings, bed-clothes, and carpets. This commodity alone constitutes a valuable branch of commerce to the Spaniards. The beaver of Canada, the Calmuck sheep, and the Syrian goat, furnish not a finer hair: that of the pacos is as dear as silk.

animal. . . . . They go in flocks of five or seven hundred; and, as soon as they perceive any person, they snort with their noses, and neigh like horses. — *Wood's Voyage, in Dampier*, vol. iv. p. 93. We saw, at Tucuman, a province adjacent to Peru, large sheep, which were used as beasts of burden, and whose wool was as fine as silk. — *Travel's of Woods Rogers*, tom. ii. p. 65.

* Camelus Vicugna. C. corpore lanato lævi, rostro simo obtuso, cauda erecta. — *Linn. Syst. Nat. Gmel.* i. p. 171. — *Molina, Hist. Nat. Chili*, p. 277.

W.

This animal possesses many things in common with the lama. It belongs exclusively to the same country; for it exists no where but on the Cordilleras. It has likewise the same dispositions, and nearly the same manners and temperament. As its wool, however, is longer and more bushy, it seems to be still less afraid of cold. It dwells more freely among the snows and ice of cold countries, and is extremely numerous in Terra Magellanica *.

The vicunas also resemble the lamas in figure; but they are smaller, their legs are shorter, and their muzzle is more contracted. Their wool is of the colour of dried roses. They have no horns. They live and pasture on the most elevated parts of the mountains. Snow and ice seem rather to refresh than incommode them. They go in flocks, and run nimbly. They are very timid; and when they perceive any person, they fly off, driving their young before them. The hunting of the vicuna was rigorously prohibited by the ancient kings of Peru, because these animals do not multiply fast. At present, they are much less numerous than at the time the Spaniards first took possession of that country. Their flesh is not so good as that of the huanacus; and they are sought after solely

* On the east coast of Patagonia, near the river Plata, the vigognes are very numerous. But these animals are so timid and fleet, that it is very difficult to seize them. — *Anson's Voyage.* The most common quadrupeds in Port St. Julian, in Terra Magellanica, are the guanacos. — *Hist. du Paraguai, par Charlevoix,* tom. vi. p. 207.

Plate 293

VICUNA.

for the sake of their wool, and the bezoars which they produce. The manner of taking them shows their timidity, or perhaps their weakness. Several people assemble to chase these animals in some narrow defile, across which cords are stretched to the height of three or four feet, with pieces of linen or woollen cloth fixed upon them. When the vicunas arrive, the motion of the pieces of cloth, produced by the wind, so terrifies them, that they dare not pass, but collect in large groups, which makes it an easy business to kill vast numbers of them. But if there happen to be any huanacus in the flock, as they are taller and less timid than the vicunas, they spring over the cords; and, when the example is once set, the vicunas likewise leap, and escape from the hunter *.

With regard to the domestic pacos, or the vicunas, they are employed, like the lamas, in carrying burdens; but they cannot bear so much weight even in proportion to their size. They are still more subject to capricious obstinacy. When once they lie down with their load, rather than rise, they will suffer themselves to be cut in pieces. The Indians make no use of the milk of these animals; because they never yield more than is necessary to suckle their young. The great profits derived from their wool induced the Spaniards to endeavour to naturalize the pacos in Europe. They were transported into

* Voyage de Frezier, p. 138.

Spain; but the climate destroyed them *. I am persuaded, however, as I formerly remarked, that these animals might succeed in our mountains, and particularly in the Pyrennees. Those who brought them to Spain did not consider, that, even in Peru, they subsist only in the cold regions, or upon the tops of the highest mountains; that they are never found in low lands; that they die in warm countries; that, on the contrary, they are at present very numerous in the neighbourhood of the Straits of Magellan, where the cold is much more intense than in the south of Europe; and, consequently, that, in order to preserve them, they should be landed, not in Spain, but in Scotland, or even in Norway. The foot of the Pyrennees, Alps, &c., would probably answer the intention still better, where they could climb to the region which was most agreeable to their constitution. I have dwelt the longer on this subject, because I imagine that these animals would be a great acquisition to Europe, and would be productive of more real advantage than all the metals of the New World, which only load us with an useless weight †, since a grain of gold or silver was formerly equal in value to what now costs us an ounce of these metals.

* Hist. des Aventures des Flibustiers, p. 367.

† What advantage have we derived from the rich mines of Peru? To procure these metals, millions of men have perished in the bowels of the earth, and their blood and labours have answered no other purpose, than to load us with an unnecessary weight.

The plate represents the figure of a male vicuna, which was drawn from the life, at the veterinary school, in 1774, the skin of which is stuffed, and may be seen in the collection of M. Bourgelat. The vicuna is smaller than the lama; it greatly resembles that animal, but it is of a lighter make: its legs are longer in proportion to its body, thinner, and better made than those of the lama: its head, which it carries erect, on a long and slender neck, gives it an air of lightness, even when at rest; it is also shorter in proportion than the head of the lama; it is wide in front, and straight to the opening of the mouth, which gives this animal a fine and lively aspect; and this appearance of vivacity is still greatly increased by its fine black eyes, of which the orbit is very large, being sixteen lines long; the superior orbitary bone is very high, and the lower eyelid is white: the nose is flat, and the nostrils, which are separated from each other, are, like the lips, of a brown colour, mixed with gray: the upper lip is slit, the same as in the lama; and this separation is wide enough to show two long and flat cutting teeth in the lower jaw.

The vicuna has also long, straight, and pointed ears; they are bare within, and covered on the outside with short hairs: the major part of the animal's body is of a reddish-brown, and the rest of an isabella colour. It is yellowish under the jaw; the breast, the belly, the inside of the thighs, and the under part of the tail, are white; the wool, which hangs to the breast, is three inches long, and that which covers the body, scarcely

one inch; there is some long wool at the end of the tail. This animal has a cloven foot, separated into two toes, which spread when it walks: the hoofs are black, thin, flat beneath, and convex above; they are an inch long, by nine lines high, and five lines broad at the base.

This vicuna lived fourteen months at the veterinary school, and had, perhaps, been as long in England; however, it was not near so tame as the lama; it also appeared to us to have less sensibility, for it showed no marks of attachment to its keeper; it even attempted to bite when it was restrained, and constantly snorted or spit at those who approached it: it was fed with coarse bran, sometimes diluted with water, but it never drank pure water, nor any other liquor; and it seems that the vicuna, like the lama, has such abundance of saliva, that they have no occasion to drink: lastly, they eject their urine from behind; and, from all these natural affinities, we may consider the two as species of the same genus, but not so nearly allied as to be mixed together.

When, in 1766, I had written the history of the lama and the vicuna, I thought there were but these two species in this genus; and I supposed that the *alpaco*, or *alpaca*, was the same animal as the vicuna, under a different name. My examination of these two animals, which I have detailed, still confirmed me in this idea; but I have lately been informed that the alpaca, or paco, forms a third species, which may be considered as intermediate between the lama and

the vicuna. I owe this new information to the marquis de Nesle: this nobleman, as zealous for the advancement of natural history as for public welfare, has even formed the project of bringing a certain number of lamas, vicunas, and pacos, from the Spanish Indies, to try to naturalize and breed them in France; and it is much to be wished that the government would second his views, the wool of these animals being, it is said, of inestimable value. The advantages and difficulties of this project are exhibited in a memoir which was given to the marquis de Nesle, by M. Beliardy *.

* Molina, in his Natural History of Chili, says, that the paco and vicuna are different species. It is very certain that they never couple together, although they live on the same mountains: besides, the wild and domestic paco are equally common in Peru, and both have characters which distinguish them from the vicuna.

The vicuna is nearly the size of the domestic goat, which it resembles in the form of the bones, the rump, and the tail; but differs in its longer neck, its round hornless head, its little straight ears, its short muzzle, its beardless chin, and its high feet. The skin is covered with extremely fine wool, that takes every dye, and which is used in the country for the manufacture of cloth.

The pacos is more robust than the vicuna, its muzzle is longer, its wool is of a greater length, but not so fine. The Peruvians keep very large herds of pacos for the use of their wool, with which they make several stuffs of the brilliancy of silk. On the contrary, the pacos is not found in Chili, either wild or domesticated.

The vicunas are most abundant in that part of the Cordilleras which belongs to the provinces of Copiapo, and Coquimbo; they inhabit the tops of the most inaccessible mountains, in the midst of ice and snow. They seem to prefer this

"The name of lama," says he, "is a generic word, used indifferently by the Peruvians, to signify all sorts of woolly beasts. Before the Spaniards conquered the country, there were no sheep in South America; they were introduced by the conquerors, and the Indians called them *lamas*, in conformity with their usual custom of so naming all woolly animals; however, in the provinces of Cusco, Potosi, and Tucuman, they distinguish three species of lamas, to the varieties of which they have given different names.

"The lama, in a state of nature and liberty, resembles a small camel; it is the height of a large ass, but much longer; its hoof is cloven, like that of the ox; its neck is thirty or forty inches long; its head, which it always carries erect, is very like a colt's; its body is covered with long wool; that on the neck and belly is much the shortest.

"This animal was originally wild, and is still

cold temperature; for all those that descend into the plains are attacked by a kind of itch, that soon kills them. They always live in flocks, and graze, like goats, on the tops of rocks. Whenever they perceive a man, they fly off, followed by their little ones.

The flesh of the vicuna is said to be excellent, and preferred to veal. It is applied externally as a specific in opthalmy: bezoars furnished by this animal are highly esteemed.

After all, there seems to be so great a resemblance between the lama, vicuna, and pacos, that, notwithstanding the authority of Molina and the concurrence of later naturalists, I may be allowed to doubt the *specific* distinction of these animals, though they clearly vary from each other in particular points. *W.*

found in small troops on the high and cold mountains. The natives have made it domestic; and they remark that it thrives equally in cold or hot climates: it produces also in its tame state: the female brings one at a time, but I could not learn the term of gestation. Since the introduction by the Spaniards (to the kingdom of Peru) of horses and mules, the use of lamas has been much neglected, nevertheless they are still serviceable, especially for agriculture; they are loaded like asses, and carry from seventy-five to a hundred pounds each: they neither trot nor gallop, and their pace is so gentle, that they are preferred by the women to any other mode of conveyance. They are sent to pasture without restraint, and never attempt to run away. Besides their domestic services, much profit is derived from their wool: they are sheared once a year, generally at the end of June. In those countries they use the wool for the same purposes as we do hair, although it is as soft as our silk, and finer than the wool of our sheep.

" The second species of lama is the alpaca. This animal has the general aspect of the lama; but it differs in having shorter legs, and a much larger body. The alpaca is absolutely wild, and is found with the vigognes; its wool is thicker, much finer, and consequently more esteemed than that of the lama.

" The third species is the vigogne, which also resembles the lama, except that it is much smaller; it is, like the alpaca, quite wild. Some persons in Lima have kept it merely out of curiosity; but I am ignorant, if these animals bring forth, or even

couple in a confined state. The vigognes, in captivity, eat almost every thing presented to them, mais, or Turkey corn, bread, and all sorts of herbs. The wool of the vigogne is still finer than that of the alpaca; and it is for that only that they are hunted: there are three sorts of wool in its fleece; that on the back, which is deepest and finest, is most esteemed; then that on the flanks, which is of a lighter colour; and, lastly, the wool of the belly, which is silvery, and of least price. These three sorts of wool are distinguished in commerce by their different values.

"The vigognes associate in numerous troops: they reside on the ridges of the mountains of Cusco, of Potosi, and Tucuman, among sharp rocks, and in savage places: they descend to pasture in the valleys. The hunters seek for their paths, or their dung, which points out the places where they may be found; for these animals have the instinctive property of depositing their dung in the same heap. . . . . . . They begin by stretching cords in the places through which they might escape: to these cords, at intervals, they fasten pieces of cloth of different colours. This animal is so timid, that it durst not break the feeble barrier. The hunters make a great noise, and endeavour to drive the vigognes against some rocks, which they are unable to surmount: the extreme timidity of the animal prevents its turning its head towards its pursuers; in this state, it suffers itself to be seized by the hind-legs. The hunters are sure to take them all, and have the cruelty to slaughter the

whole troop on the spot. There are acts for their preservation, but they are not observed. It would be, however, easy to shear them when taken; and thus a new wool would be left for the next year. These chases generally produce from five hundred to a thousand skins. When the hunters unluckily find the alpaca in their beat, the chase is lost; this animal infallibly saves the vigognes; they leap the cord without fear of the rags, break the enclosure, and the vigognes follow.

"In the whole range of the Cordilleras, from the north of Lima towards Quito, we find neither lamas, alpacas, nor vigognes, in a wild state; however, the domestic lama is very common at Quito, where it is loaded and employed for all agricultural purposes. To procure the vigognes alive, from the south of Peru, it is necessary to march them down the provinces of Cusco or Potosi, to the port of Arica; there they may be shipped for Europe: but the navigation from the South Sea, by Cape Horn, is so long, and subject to so many vicissitudes, that it will be, perhaps, very difficult to preserve them during the voyage; the best and surest expedient would be to send a vessel expressly to the river Plata: the vigognes might be caught, without injury, in the province of Tucuman, and conducted to Buenos Ayres, there to be embarked. But it would be difficult to find a homeward bound ship at Buenos Ayres, prepared for the transport of three or four dozen of vigognes; and a ship fitted out in Europe for the express purpose, would not turn to so much account as if freighted by chance at Buenos Ayres.

"We must consequently commission a commercial house at Cadiz to arm a Spanish vessel for the river Plata. This vessel must be loaded with merchandise, such as may be fairly traded with, and permission only required for a man or two charged to procure vigognes in return. These men must be furnished with passports from the Spanish minister to the governors of the country, that they may be assisted in the object of their commission. An order will be necessary at Buenos Ayres, for Santa-Cruz de la Sierra, to procure from the mountains of Tucuman three or four dozen of living female vigognes, with half a dozen males, some alpacas, and some lamas, half male and half female. The vessel must be arranged for their easy accommodation: for this purpose, the reception of all other merchandise must be prohibited, and they must be directed to touch first at Cadiz, to rest the vigognes, and from thence they may be transported to France. . . . . Such an expedition would not be very expensive. . . . . An order might be given to the king's naval officers, as well as to all ships returning from the Isle of France and India; that if, by chance, they are thrown on the coasts of America, and obliged to run into harbour, to prefer the river Plata. While the vessel is repairing, they ought to neglect nothing with the natives to procure some live vigognes, male and female, as well as some lamas and alpacas; there are Indians at Montevideo who go thirty or forty leagues a day, and who would acquit themselves well of the commission. . . . . It would facilitate the business, if the

French vessels, which return from the Isle of France or India, would stop at Montevideo instead of going to St. Catherine's, on the coast of Brasil, as often happens. The minister who would contribute to enrich the kingdom with so useful an animal, ought to be applauded as for the most important conquest. It is surprising that the Jesuits have never dreamed of naturalizing the vigognes in Europe; since, masters of Tucuman and Paraguay, they possess this treasure in the midst of their missions and finest establishments."

I communicated this interesting memoir of M. l'abbé Beliardy, to my worthy and respectable friend M. de Tolozan, commercial intendant, who, on all occasions zealous for the public service, conceived that he ought to consult an intelligent man (M. de la Folie), inspector general of manufactures, on the contents of the memoir, and the following are his remarks upon the subject *." . . . .

Animals which feed upon herbs and inhabit the high mountains of Asia and Africa, produce what are called the *oriental bezoars*, the virtues of which are so much extolled. Those of the European mountains, where the qualities of the plants are more temperate, produce only useless balls called *ægagropili*; and, in South America, all the animals that inhabit the mountains of the

* As these remarks consist merely of a recapitulation of M. Beliardy's memoir, they are omitted; as well as the observations of M. l'abbé Bexon, on the introduction of vigognes into France for the sake of their wool.

W.

Torrid Zone, furnish what are denominated *occidental bezoars*, which are still more solid, and have, perhaps, higher virtues than the *oriental*. The *vigogne*, or wild pacos, produces a great number, as well as the huanacus. These stones are likewise produced by the stags and roebucks on the mountains of New Spain. The lamas and pacos produce no fine bezoars, unless when in their natural wild state. The domestic kind afford only small, black bezoars, without any virtue. The best stones are of a dark green colour, and generally proceed from the wild pacos, particularly those which inhabit the highest parts of the mountains, and commonly pasture among the snows. Of these mountain pacos, both the males and females produce bezoars. They hold the first rank after the oriental bezoars, and are in much higher estimation than those of New Spain, which proceed from stags, and are less efficacious than any of the other kinds.

END OF VOL. VIII.

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